ELECTRIC VEHICLES

Vol. 5 CHICAGO, JULY, 1914 No. 1

A HIGH-SPEED BAKER ROADSTER


EMC
ESTABLISHED 1907
PUBLISHER
TECHNICAL MAGAZINES
AND TECHNICAL BOOKS

INDEX TO VOLUME V

ELECTRIC VEHICLE

July 1 to December 31, 1914

Published Monthly By
ELECTRICITY MAGAZINE CORPORATION
Monadnock Building
CHICAGO

Entered at Chicago Post Office as Second Class Mail Matter

ELECTRIC VEHICLES

WITH WHICH IS INCORPORATED IGNITION
TRADE MARK REGISTERED IN THE UNITED STATES PATENT OFFICE

SUBSCRIPTION PRICE
Domestic - $1.50
Canada - - $1.75
Foreign - - $2.00

FOR SALE AT ALL NEWS STANDS

If Your News Dealer Will Not Supply You—Please Notify Us

Volume V | CHICAGO, JULY, 1914 | Number 1

Selling Electric Vehicles

A Motion Picture in Two Reels Performed by an All Star Cast of E. V. A. Members

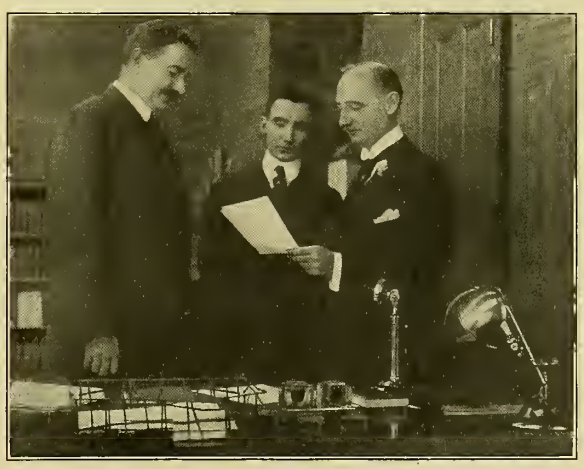
BY S. G. THOMPSON

THE Alway-On-The-Job Smith Company is in trouble. Big Chief F. W. Smith receives daily reports from his transportation manager (a part taken by Joseph F. Becker on account of his familiarity with free transportation in the United Co.'s autos), and every day his stock of dead horses increases. Not being in the provision business, President Smith sees bankruptcy peeking at him over the nearby skyscrapers until his secretary, Harvey Robinson, in a lucid moment is able to read letters from the E. V. A. signed by the well-known penman A. Jackson Marshall, its expressive secretary. Without stating how far back, the letter calls attention to interests valued at a paltry five hundred million that are back of the movement to take the 'orse out of remorse. Backing with joy, faithful old Harvey rushes to the boss with the letter and an answer is despatched. David F. Tobias is called to take the dictation, and as it is well known that Tobey learned shorthand in the fo'castle of a tug boat, the camera is gently moved to and fro during this interesting scene, giving a perfect imitation of his familiar practice of rocking the boat.

In due time the letter arrives at the Engineers Building, accompanied by postman W. C. Andrews and driver F. Nelson Carle, of Uncle Sam's Parcel Post Service. Rumor has it Carle's "driving" in the get-a-way was worse than Andrews' attempt to relieve the sombre dignity of the Marshall film. Through a little slowness in getting up to the curb, some pleasure cars broke the traffic rules in regard to impeding the mails and the action of the picture was delayed by such well-known delayers as T. C. Martin, formerly of London and soon of Philadelphia; George H. Guy, the pianist; S. A. Sewall, who conducts the answers to correspondents column in a popular magazine; and H. G. McConnaughy, the druggist. As Miss Gladys Burkhalter, the popular assistant secretary of the commercial section, N. E. L. A., is in this picture, the public demand for its exhibition has been too great to be ignored and it is shown without apology for the inferior acting of the other characters.

But returning to the letter. After examining a package of the new garage signs which seem to appeal pleasurably to Secretary Marshall, Miss Johnson, his filet of sole mate, calls his attention to the letter from the Smith Company requesting information. From then on the action is fast and furious. It starts off by a ridiculous exaggeration—excused on the ground of dramatic license. Marshall calls up the central station representative, Stephen G. Thompson, and finds him in his office. Strenuous efforts have been made to cut this part out or modify it, but Thompson

Scene in Secretary Marshall's Office. W. C. Andrews, Postman, Enters.



Frank W. Smith as President, and Harvey Robinson as Secretary.

says it is his scenario written by himself after a $10 correspondence course, and it stays in. He says one of the rules of scenario writing makes it impossible to call up on a busy wire or not find the phonee at his desk. He promised to show this rule to the committee but reports that the book containing it has been taken on a trip by one of the men to whom he is subletting the correspondence course at $6.66 each. So the plan to run in a few regular movies while they were locating S. G. T. was abandoned, and with assistance of man Friday Miller the central station representative collects last week's expense account and starts for prospect Smith. Persons with a tendency to heart failure or who have previously suffered fatal nervous attacks should request that the crank be turned slowly for the rest of the reel. Within the short space of 500 feet of film (at a foot a second) President Smith is interviewed by a consulting traffic and transportation engineer and two gangs of battery salesmen who prove their cases by experiment and demonstration, and then he gives an order for ten electric trucks after having been shown a parade of electrics from his office window. It is a wonderful example of team work, each salesman and engineer doing his part and reminding one of the building of a Ford car or the dressing of a pig in a Chicago packing house.

One with a quick eye will catch the details as follows: Arriving at the prospect's office the central station representative proceeds to unfold his story and a few panoramas and pictures of perfectly good electric fleets. At the psychological moment when F. W. is about to beg for the telephone number of the manufacturers (knowing that he will catch him in a Thompson scenario) the C. S. R. laughs silently and exits left center leaving his photographs to do their duty. Among the photographs is a sure enough chart prepared by engineer W. P. Kennedy, and in his excited state the prospect reaches for the phone and calls for help. It comes. At this point the somewhat commercial character of the action gives way to art and the beautiful. The plain interior of the Kennedy office, like an old stone crock full of fresh wild flowers, merely accentuates the graceful actions and striking personalities of the next characters. Damon and Pythias, David and Jonathan, St. Paul and Minneapolis—none can compare with the E. V. A.'s matinee idols, Kennedy and Cushing. H. C. Cushing, Jr., collaborator, litterateur, clubman, yachtsman and chronicler of electric vehiclisms, who has so often drawn on his imagination, is discovered drawing on an actual board. This almost perfect mimicry of real work is considered one of the greatest triumphs of the film. Getting the telephone message, engineer Kennedy speeds him to the A. O. J. Smith Company, where it takes him but 15 feet 3¾ inches to convince the president that too many electric trucks are not enough.

And now the dam breaks and the flood descends. In the next 30 feet Charles Blizard and his fellow quaker, Bruce Ford, take a two hour trip on the Pennsylvania and get to the president without an appointment. Before they are eradicated from the film, W. G. Bee and H. H. Smith offer Orange aid in generous measure (30 feet of film). After exit they get an extra ten feet to their credit by the efforts of Mr. Smith to make one of Mr. Bee's cigars go a long way—some fourteen stories.

The efforts of the salesmen have practically decided the prospect that he will require a storage battery and as usual the head of the Long Island patrol gets a hunch there's a market for a truck. Enter P. D. Wagoner of the Queensboro Bridge. Business of interfering with routine duties. A "natural" exchange. New method of salesmanship demonstrated. Method consisting of having fifty or a hundred trucks lined up near prospect's office and when prospect is brought to window by salesman start the parade. Result absolutely certain as proved by next scene where contract is signed and delivered for ten trucks—with battery orders divided 50-50.

A year of prosperity has rolled by. No longer a prospect, President Smith has become a testimonial writer and "ready reference" and will soon enter the ranks of "old user." Arriving in his electric in the early morning he is always beaten to it by his (recently) late secretary, who now has an interest in the business (mental, not financial). Together they read the annual report of Master of Transportation Becker, who looks five years younger than in the first scene and whose hearty laugh can be plainly heard by a lip reader. Congratulations all round as virtue triumphs and transportation troubles trail to the past. Smiles on every face and a close scrutiny will even show the ceiling beams. And so the curtain and an after view of the Always-On-The-Job Smith fleet—grown to imposing dimensions and lovingly labeled "This did It."

Philadelphia Motor Truck Association Meets

At a meeting of the Motor Truck Association of Philadelphia held June 17, at the Adelphia Hotel, W. H. Metcalf of The Bartlett Garages, Inc., acted as chairman in the absence of the president, E. B. Jackson of the Packard Motor Car Company. Representatives were present from all of the motor truck salesrooms in Philadelphia. Each of the tire companies had a representative present. At this meeting motor truck body builders had been invited to attend and there were representatives from all of the larger body building houses in Philadelphia and vicinity.

Lieutenant William D. Mills of the Traffic Squad gave an excellent address on the traffic situation in Philadelphia, which was greatly appreciated by those present.

E. J. Cattell, the city statistician and well known Philadelphia orator, aroused great enthusiasm among the men by his facts and figures of the enormous manufacturing industries in Philadelphia. His address will long be remembered by the members.

Mr. Cattell was followed by E. S. Foljambe, editor of the *Commercial Car Journal,* who gave a very interesting talk.

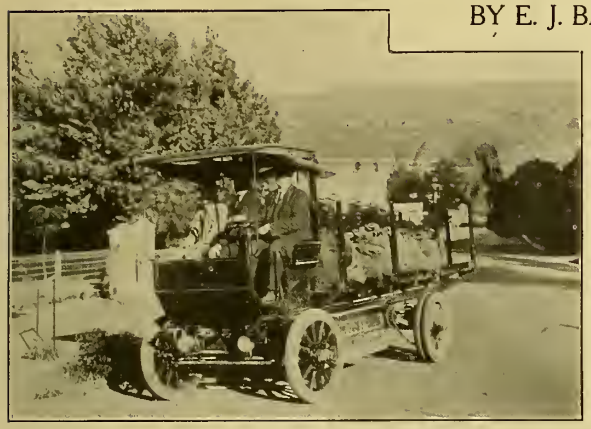
A number of new members were taken into the association, E. M. Bartlett of the Stanley Motor Carriage Company was appointed chairman of the publicity committee, and Emlen S. Hare of the Commercial Truck Company was appointed chairman of the entertainment committee. W. Ross Walton was elected chairman of the admission committee.

The members of the Motor Truck Association are enthusiastic over their progress and the active work that is being done by the association. There were sixty-nine representative men of the motor truck industry at this meeting.

Utility of Passenger and Commercial Electrics

A Paper Read Before the Electric Vehicle Association

BY E. J. BARTLETT



Baker 2-Ton Open Body. Union Coal Co.

A GREAT deal has been said and written about the electric vehicle and what it is doing. "Utility of the Electric Vehicle" sounds rather elementary. It is an old topic but it is the liveliest topic of the day, to the user and central station operator as well as the electric vehicle manufacturer. It is doubtful if any of us fully realize the work the modern electric vehicle is doing; its wide scope and the wonderful possibilities it has of revolutionizing our passenger and merchandise road operating systems.

Several years ago, we drove, as an experiment, an electric runabout nearly 250 miles on a single battery charge; this figure has since been exceeded. For some time a specially designed racing car, the "Baker torpedo," held the world's record for motor car speed, making a mile in 42 seconds or at the rate of over 85 miles per hour. You are all familiar with the run from Boston to Chicago that was made late last fall by a Boston built electric roadster.

These accomplishments are of general interest, showing what the electric has done. The electric, however, is not and probably never will be, a high speed machine suitable for touring purposes. It will never seriously compete with the gasoline car for such work, although in time, as cross country roads are improved and charging facilities become more numerous, the electric will be used to a limited extent in short tours from city to city.

The utility of the electric pleasure car does not depend upon high speed and long mileage, although it has sufficient speed and mileage for ordinary town and suburban driving. The speed of electric vehicles on the market average some 22 miles per hour for the lighter machines and 18 to 20 miles per hour for the heavier five-passenger enclosed cars. The mileage of such machines under ordinary fairly level city and suburban street conditions, is seldom less than 75 miles per battery charge. It is not unusual for people who are careful in the operation of their cars, to obtain 1,000 miles for every 10 battery charges. We frequently obtain such reports from our customers.

The feeling that the electric pleasure car is essentially a woman's car is passing away. Certain features of the electric pleasure car, such as its beauty, comfort and lack of mechanical complications, appeal to the woman purchaser, not only because she feels she can drive an electric easier than a gasoline car, but rather because she cannot see the value of the complicated mechanism necessary to the modern gasoline car which even approaches an electric in ease of operation. She appreciates the fact that an electric is simple in construction; that it only has a few parts which could possibly get out of order; that it is always ready to use; cannot be stalled in traffic; has a short wheel base to facilitate turning, and is light and easy to operate.

The same opinion is fast gaining ground among men. Troubles were more numerous in the old days and not so well charted. There was perhaps a feeling of pride in being able to drive a gasoline car and to fix it if it went wrong. The very fact that most men are now amateur automobile repair men, means that the fascination of making minor repairs and getting covered with grease and dirt no longer exists.

There are a great many business and professional men who have been experienced gasoline car drivers for years, who are now turning to the electric as the handy car in which to get about town. In the majority of cases where a man buys his wife an electric, he becomes accustomed to using it more and more for his own town driving. Where two cars are owned, the family gasoline touring car stands more and more of the time in the garage. Touring for pleasure has become a family pastime to be indulged in now and then; it is no longer a hobby. The automobile has taken its place with the telephone, electric light and other mechanical appliances, considered essential to the comfort and happiness of the home.

In Cleveland, Chicago, Buffalo, Detroit, Rochester and in fact, in a considerable number of our larger cities, there are a great number of electric pleasure cars in daily use. Doctors and lawyers are driving them in preference to operating their own gasoline

A Baker Electric for Family Use.

cars or having a chauffeur drive for them. Mother takes the children to school; daughter takes father to his office, and mother shopping; lunches with friends in one of the suburbs; goes to the matinee, and the whole family goes for an evening drive along the boulevard. The electric has a utilitarian value for the entire family, individually and collectively.

Figuring the life, depreciation and all elements of expense, pleasure and service obtained, the electric pleasure car may be operated for about one-third the expense and one-tenth the bother of a high grade gasoline car. Cheapness, convenience, and reliability for all purposes of the family and for all business and social usage, is stamping the electric as the family town car. Its utility may be in part realized by considering the large amount of the family driving that comes within its speed and mileage range, and the really small amount of touring done which would demand a gasoline car.

The utility of the electric truck is measured by the work it can do and the expense of doing it.

The work capacity of any trucking system depends on the load, speed and time operated. All three factors must be considered in determining what a truck can do under given conditions.

The usual standard sizes in which electric and gasoline trucks are built are, ½-ton, 1-ton, 2-ton, 3½-ton and 5-ton load capacities. The speed of the electric is usually about 13 miles per hour for a ½-ton truck to 7 miles per hour for a 5-ton truck, and the average speed of gasoline trucks of similar sizes is some 25 per cent higher. With normal service conditions, electric trucks may be depended upon for about 98 per cent of the working time; gasoline trucks about 85 per cent and horse about 75 per cent.

If we take as a comparison, the number of ton miles each type of truck would travel during a period of say, 300 working days, we get the following figures:

One electric truck, 300 by 45 at 98 per cent would equal 13,230 ton miles; one gasoline truck, 300 by 45 at 85 per cent would equal 11, 75 ton miles.

These figures are typical of many service requirements. The electric truck in the majority of cases will haul the same load as the gasoline truck, and haul it more miles per year in average service,—for the reason that the electric although a little slower, is a great deal more continuous in its operation. This comparison is true up to about 50 miles per day.

Continuous service is a guaranteed feature in a well built electric truck. It results, because the construction is simple, and has very few parts which can possibly get out of order. The storage battery today, is reliable in its performance and its cost is not excessive.

Those of us who have to do with electric trucks, do not always appreciate what the simplicity of construction means from a standpoint of continuous service and reliability. It does us good, now and then, to compare the simple construction of the electric (with which we are all familiar) with the complicated construction of the gasoline car. If we place ourselves in the position of the head of a company, using a number of motor trucks, employing drivers at twelve or fifteen dollars per week, we can appreciate there is some satisfaction in knowing that the electric is a simple machine, and that is, speed is predetermined. When the head of such a company thinks of the "wild indians" which he has to employ as drivers, it is a comfort to think that in the case of his electric trucks he has no engine speed which must be delicately manipulated; no clutch to throw or gears to change. Even with the most careful driving of the gasoline car, there are general periodical overhaulings to be done, carbon to be removed, valves to grind, cooling systems to freeze and many similar cases for intermittent service which cannot very largely come under the attention of any one man, but must be handled by the individual drivers, regardless of their responsibility. It is a fact—not theory—that at least 15 per cent of the operating time of gasoline truck installations is required to keep them in operation the balance of the time.

This greater repair liability is due not only to the more complicated mechanism, but to the higher speed which such trucks attain. Speed has ruined hundreds of thousands of dollars' worth of gasoline trucks by shortening their efficient life, and this loss is causing many potential buyers to hesitate. Normal service requirements do not demand a higher speed than given by electric trucks. For unusual conditions higher speeds may be required. If so, they can be obtained by the use of gasoline trucks at an additional cost.

The long life of an electric truck is another important feature. The purchase of an electric truck installation provides for a permanent trucking system for ten, twelve or fifteen years, by renewing batteries and tires. True, one can renew tires, engines, magneto, carburetor, clutch, transmission, countershaft, in gasoline trucks, but one does not go that far very often, as it is not worth while. In from two to five years, depending on the type of car and service, gasoline trucks are sold or traded in. Second-hand gasoline trucks are a drug on the market while it is almost impossible to purchase a second-hand electric truck. The reason is, that the owners of electric trucks purchase new batteries and tires and keep them going. This charge for depreciation has a considerable bearing on the operating cost and while it is not the purpose of this article to discuss in detail, operating costs, it may be said in general, that an annual depreciation charge of 10 per cent is liberal in the case of the electric truck and to this depreciation charge could be added, in the case of the ½-ton truck, $1.86 per day; for the 1-ton truck $2.27; 2-ton truck, $2.88 and 3½-ton truck $3.92; these charges covering the items of charging current, battery depreciation, tire wear and the replacement of miscellaneous small parts necessary to keep the truck in running condition.

With the yearly expenditure of the above amounts, the efficient life of the well built electric truck chassis is conservatively ten years under normal operating conditions. All other expenses such as painting, body repairs, driver, storage, washing, polishing, etc., depend entirely on local conditions, and may readily be estimated by the purchaser.

I have, in the foregoing, tried to sketch briefly a few of the reasons for the utility of the electric truck. There is much more which could be said along the same general lines as to hill climbing ability of the electric, its freedom from fire risks; that inexpensive drivers may be used to operate it, and other arguments in favor of the electric with which you are all no doubt familiar. It would be possible to enumerate a lot of statistics showing the work done and the cost of doing it in numerous installations, but I believe that briefly, the following record which was compiled by one of our

large customers located in the middle West, will show you plainly, the reliability and the utility of the electric under severe winter operating conditions.

This record covers the winter months just passed, in which as you will recall, occurred some real winter weather accompanied by heavy snow falls. During these months this particular installation worked 4,900 truck days, of which 3,400 were electric and 1,500 gasoline truck days.

For the 4,900 truck days there were 166 cases of trouble reported; 74 of these applying to electrics and 92 to gasoline trucks. I hope you will get these figures clearly in mind. They mean that for every 100 electric truck days there were two cases of trouble reported, while for every 100 gasoline truck days there were six cases of trouble reported; or three times as much trouble with the gasoline as with the electric trucks, and this result obtained through blizzards and snow storms.

It is interesting to know that 43 of the total 74 electric troubles were cases of exhausted battery, and that the earliest case of exhaustion reported for any truck was 5:00 o'clock in the evening, or after the truck had been out in the storm and snow at least 11 hours. The other troubles were principally broken chains and loose tires.

The gasoline truck troubles were mostly broken chains, loose tires, trouble with cooling, lubrication and ignition. Several cases of serious trouble were reported due to the engines running without lubricant; the driver keeping his engine running continuously to prevent freezing, or to be able to start it, thus using oil faster than he anticipated. The result of course, being burned connecting rod bearings, scored pistons and cylinders.

Nearly all of these trucks had been in service some 18 months at the time this record was compiled. The battery equipment had thus seen considerable wear so that the conditions were not unusually good, but were about the same as might be expected in normal service.

I have arranged these records on a truck day basis, that the percentages might be more readily applied to smaller installations. On a basis of what this installation is doing, one could operate a single electric truck under the same conditions 100 days through the dead of winter and have about one case of exhausted battery, and one broken chain, loose tire or something of the sort. If the truck was operated 100 days through summer conditions, the failure of the battery would be eliminated and there would be about one trouble developed during the entire 100 days' operation.

This is a wonderful record and drives home to those in close touch with such daily performances, the all-around utility of the electric truck.

I do not believe that this installation is doing any more wonderful work than are other installations of electric trucks operating from coast to coast. We are continually making investigations of our trucks used in different parts of the country and under different service conditions and as familiar as we are, with the many good features of the electric truck, we frequently marvel at, not only the amount of work they do, but the small amount of expense and trouble involved in doing it.

One evening last winter in New York, I was talking with a man connected with a company having several hundred motor trucks, both electric and gasoline, in their service. This man is in close touch with the work his trucks are doing and the delay and cost involved; his experience covering a period of several years with several makes of electric and gasoline trucks; some of the electrics being nearly eight years old.

His conversation was substantially as follows:

"If every company having city trucking work to do, could understand the merits of the electric truck when properly applied and cared for, as I do, the gasoline truck would be used for a comparatively small part of the city work. Neither truck will perform at its best when misapplied, and both types are essential to the most satisfactory operation of almost every large installation."

The design, construction and production of trucks has advanced to a point that our problem is, no longer to make a truck for less money that will run faster and farther at less cost (desirable as such progress is) but rather to drive home to the prospective buyer the utility of the modern electric truck as now built.

There are two general methods of rail transportation—express and freight.

Freight is slow but cheap, and handles the bulk of heavy shipping. Express is quick and important for some shipments, and expensive. Each has its field and for the most part, these fields do not overlap.

There are a lot of goods being handled every day by the express method with gasoline trucks, which should be handled on the freight basis with electric trucks. It is taking time to familiarize companies having trucking to do, with the utility of the electric truck and as such realization is brought about, the true fields for the electric and gasoline truck are established.

It takes experience to learn the proper application of motor trucks in any particular business and unfortunately, most people who spend their money for such equipment feel it is their privilege to get their experience first hand, as indeed it is. As a result, there were sold during the year 1913, perhaps 20,000 gasoline trucks. As a result of the installation of these 20,000 trucks, there is a market in process of creation, for perhaps two-thirds of this number of electric trucks. The owners of gasoline trucks are turning in increasing numbers toward the electric truck and it is among companies who have had direct gasoline truck experience, that we find our readiest market.

The every day usefulness of the electric pleasure car and electric truck is being appreciated more now than ever before. Its performance is not brilliant in the making of speed and mileage records. The inherent characteristics of the electric vehicle will not permit of its competing with the gasoline machine for such work. Just as truly, these same inherent characteristics permit of an economical operation which is being appreciated by the automobile buying public, as the novelty of the gasoline vehicle and its expense is lessened through its wide use.

Utility is the key-note which is entering into the purchase of automobiles, both pleasure cars and trucks, more and more, and utility is the one feature which will influence the purchaser of the electric vehicle more and more as time goes on.

The agency in St. Louis for the Lincoln electric charger, a charging apparatus for electrics, designed especially for home garages, has been taken by the Electric Garage and Service Company. The charger is made by the Lincoln Electric Company.

Salt Lake to Ogden in a Rauch & Lang

From Salt Lake to Ogden and return at an average speed of fifteen miles an hour without recharging batteries, is the record made by a Rauch & Lang electric coupe carrying three passengers. The electric coupe left The Herald-Republican office at 7.17 a. m. and stopped in front of the Examiner office in Ogden at 10.10 a. m., the trip being made in less than three hours, inclusive of several stops along the way to take pictures of the scenery and car.

Those who made the trip in the machine were A. F. Hughes, factory representative for the Rauch & Lang concern; J. W. Spiker, Salt Lake agent for the electric auto, and W. J. Lewis, Jr.

The electric machine rode as easily as a Pullman car, say those who made the trip, and the absence of dust and noise was the most enjoyable feature of the

Rauch & Lang Used in Record Run.

ride. It is asserted that this is the first instance on record where an electric machine has run from Salt Lake to Ogden without charging the storage batteries at least once en route.

While the Rauch & Lang electric is especially desirable for women's use, says J. W. Spiker, Salt Lake agent for the machine, it is also well adapted for business men who wish a quiet, elegant car for use in the downtown district. The electric automobile is inferior to none for use where it is desired to maneuver quickly and where quick stopping and starting are required.

Philadelphia to Washington and Return

Thomas A. Edison and Dr. Steinmetz, speaking at the recent convention of the National Electric Light Association, in Philadelphia, called attention to the rapid strides being made by the electric vehicle and predicted tremendous developments in the immediate future.

To the central station men gathered at the convention from all over the country, R. L. Heberling of the Philadelphia Storage Battery Company, and J. D. Maxwell, Jr., of the Anderson Electric Car Company, made a demonstration on Sunday and Monday of the capabilities of the modern, high-powered electric vehicle for general cross-country work.

Leaving Philadelphia early Sunday morning in a stock electric roadster, with standard battery equipment, such as is regularly furnished in cars of this type, they made Wilmington in 1 hour, 35 minutes. While getting breakfast, the car was given a "boost." The next stop was Bel Air, where they had lunch. While eating lunch, the car was "boosted" at the local electric light station, and the trip resumed to Baltimore. Another "boost" was given at Baltimore, and the travelers arrived at Washington in the early evening, the full running time being 8 hours, 47 minutes over a distance of 167 miles, maintaining an average speed of 19 miles per hour.

Leaving Washington on Monday morning shortly before noon, they arrived in Baltimore in time for lunch, during which time the batteries were given a "boost," and the journey resumed to Bel Air. They "boosted" the car while supper was being disposed of, and the car was once more on its way to Philadelphia, but the wrong road was taken, and the travelers found themselves 21 miles out of the way on a road deep in mire and clay, thereby greatly delaying the trip. After having once more gotten on a good road, Wilmington was reached without incident, and after a short "boost," the 32 miles between Wilmington and Philadelphia were covered in 1 hour, 27 minutes.

While this run establishes a new record for an electric vehicle between these points, yet it more than demonstrates the capabilities of the modern electric car and the wonderful development which has taken place in battery construction.

103 Miles on a Charge

To demonstrate that the electric car has reached a point in its development where it is feasible to operate over fair, ordinary country roads within a twenty-five-mile radius, H. J. Myer, Jr., and H. E. Woodward drove a standard four-passenger Baker coupe of the Abbott Automobile Company, New Orleans, to Pointe-a-la-Hache and return. The distance is 48 miles and they averaged a little better than thirteen miles per hour throughout the entire trip. For good measure the same machine was driven over the city streets, an aditional nine miles, making a total of 103.4 miles on one charge of batteries.

Leaving the Abbott store at 9:40 the car was driven via Canal, Rampart, Kerlerec, Bergundy, Montegut, St. Claude avenue and the shell road to the Pointe without a stop. This is the first electric vehicle to make on its own power so long a trip in this section, and there was much speculation as to the outcome of the trip among automobile owners. Several enthusiasts drove down to the Pointe in their gas cars, carrying two ropes, with the idea that assistance might be needed.

It is not claimed that trips of this kind should be attempted by every owner of an electric car, but with the weather conditions which prevailed, and the car in fine condition, the trip can be made, and it does demonstrate beyond any question of a doubt that within a twenty-five-mile radius under fair road conditions any one can drive an electric car successfully.

Relation of the Automobile to the Central Station

A Paper Read Before the National Electric Light Association Convention

BY DR. C. P. STEINMETZ

THIS subject on which I desire to speak is the relation of the automobile to the present central station industry.

To understand this relation, I have first to survey the historical development of the automobile as it takes place before our eyes today. Like all sports, the history of the automobile development comprises three stages or periods: the period of initial development; then the period of culmination, where it has been picked up and made the popular dominant sport of society, and then the period of decay as sport, and readjustment in a permanent condition as a business proposition.

In the Good Old Days.

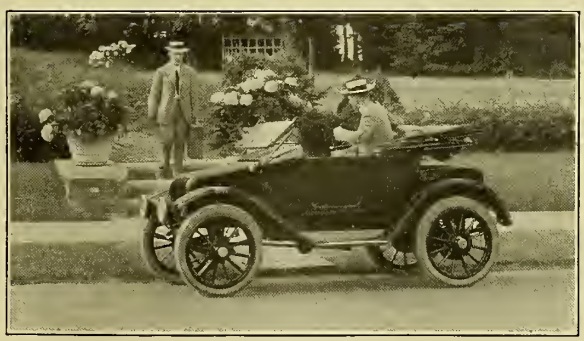
Now, the automobile has not yet reached that latter permanent condition in modern life, and therefore to illustrate the three periods of popular sports, their relation to each other, and the causes leading from the one to the other, I may be permitted to illustrate it on another popular sport. But I wish to draw attention to it that every word I say about this can immediately be applied to the automobile as modern popular sport, as far therein as the development has progressed.

As an illustration I may dwell upon the popular sport of the bicycle, since this has passed through its history and has reached permanent conditions. Now, there we find the initial period of development, the time of the high wheel, the early days of the safety, those times where it required very great enthusiasm and hardihood to stay by it; all that, you see, you can immediately transfer to the early days of the automobile, where it was doubtful when going out, whether the rider and the wheel would come home whole and together. Where even the legal status of the wheel was in doubt. Where the roads to go on did not yet exist. Still the development slowly but gradually progressing, the wheel became more reliable, and finally a time came when society picked it up as the popular sport.

Then followed the period of culmination in bicycling as a popular sport where everybody indulged in it, the young and the old, ladies and gentlemen, the business man and his clerk, the factory owner and his lady stenographer went to work and from work on wheels. In fact, where every Sunday and holiday thousands of wheels went out for cross country riding for long distances, going out into nature, and enjoying the mild pleasant exercise in pushing the wheel. Where it seemed to be the desire of the rider to see how fast he could go and how great a mileage he could roll up. Where century-run riding was a popular sport. The days of the sport when the Wheelmen's Association, when the L. A. W. was a power in the land, making and unmaking laws, where bicycle roads were built all over the country, where bicycle manufacturing companies and repair shops sprang up like mushrooms all over the land.

Then the wheel became cheaper, went down in price, so as to be within the reach of everybody, and it became a universal sport. And then came the time when the head of a business met his clerks and his stenographers on the side paths and at bicycle inns on even terms; where the society lady met the lady's maid out with her fiancé on the cycle paths and at the bicycle inn, and those people who did not care to meet socially were thrown together. And then came the time when those who desired to be exclusive became dissatisfied with bicycling as a sport and withdrew from it. And first in England and afterwards in this country and elsewhere, bicycling ceased to be a popular sport of society.

Then the middle class, which always follows the lead of the others, however much it may deny it, also ceased bicycling. Ladies are no longer seen on bicycles, the prominent men of industry and the owners of factories and older people who desire to keep some of their dignity are not riding the bicycle any more across the country. The country roads for bicycling are standing idle, and bicycling has ceased to be a sport. But there are probably more bicycles now in existence than ever before. The bicycle is now a business convenience, it is now a convenient means to go to and return from work. In short, it has come to stay, but no more as before, where any conversation between any class of men or women within a few minutes all was turned into discussion of bicycling, the question of single tube as against double tube, chain as against the gear; all that has ceased, and the bicycle is a bicycle just as a carriage is a carriage. It is merely a convenience and a commodity, and as such it has found a permanent place in modern life; a very useful one, but it is not a sport any more.



A Speedy Baker Roadster.

This has been the history of every popular sport which has any social utility. This you see now taking place before your eyes with the automobile. The automobile has been and is still the popular sport of the exclusive; but in the last years by mass produc-

tions cheap and reliable automobiles have come on the market, and the automobile now has become available to the more prosperous middle class. And now we see on our automobile roads not only society people, or very well-to-do people, but we also see people of moderate means, and we see them in increasing numbers. That means that now, in the last year and this year the prominent man and the society lady meet at the automobile rest house on the automobile road; the man meets his foreman and his mechanics in their automobiles there, and the lady meets maid-servants and others of that class; and that means the exclusiveness of automobiling and all pertaining thereto has ceased today. And when you look around you will find this year already there is an appreciable falling off in long distance touring by automobile by the very well-to-do exclusive set.

This is the beginning of the end of automobiling as a popular sport. You will see it more marked still during the next year. It will undoubtedly take well for some years, while the automobile will be frequently met on the highways between cities and on long distance tours when those people of moderate means to whom the automobile has just become available enjoy the automobile as sport. But it will not stay at that, for we must realize that when the glamour of the sport begins to vanish; as they have realized that it is hard work to drive a bicycle, that it is not a pleasure to take care of it and tone up the chain, etc., they will all realize that maintaining and taking care of an automobile and its engine is not a pleasure. As soon as it ceases to be the desirable sport of all those who desire to amount to anything, they will then realize it is hard work to propel a high-powered machine over country roads. When that time comes, then the automobile will find its sphere—not as an appliance of sport, but as a useful commodity, a business and pleasure vehicle.

But with the change which you now begin to see beginning, that naturally will materially affect the character and the structure of the automobile.

In the bicycle, while there are probably more bicycles in use today than ever before, the average riding distance is very greatly decreased. There are very few people any more who care to ride 100 miles a day or so, and the average distance where they are used continuously as for purposes of business is much less. It is now a useful means of propulsion; no longer a sport.

You will see the same with automobiles, that long-distance cross-country riding will decrease as soon as the automobile ceases to be a sport, but it will become much more than now, a utility.

To illustrate and discuss the changes which of necessity will occur then, we must look over the technical development of the automobile. The first attempts were made in three different directions: By the steam engine as motor propulsion; in the gasoline-driven automobile, and in the electric automobile. The steam engine soon dropped out of competition. It is too much of an engine to get the best efficiency and economy in which it was superior to the gas engine. It required more engineering than the average owner and operator of an automobile is willing and capable to bring to the operation of his car; so the steam car went out of the competition.

The electric battery, though, soon had to drop out as motor propulsion of the sport automobile, because in cross-country riding with the automobile, as sport in touring, the two main considerations where high speed and long distance of operation are concerned, are the same two which dominated in the day of the bicycle. The electric car was hopelessly outclassed in both of these directions, and therefore had to withdraw from the competition. It did not disappear, but found a field of its own, a field of providing a convenient, safe and reliable vehicle for business and pleasure purposes for those who did not use the automobile as sport and for touring across the country, but who kept it for town use, as a business and pleasure vehicle. Indeed, those uses in my opinion will be the permanent applications of the automobile after the period of sport has passed.

But even in this field the electric car has been very seriously handicapped when compared with the gasoline car, because even there the automobile is sport for the purpose of going to work, for the purpose of the physician in making his round of visits, for the purpose of the electric central station in providing its employees with means to get around quickly. There is always this idea in the mind of the owner or employee or user of an automobile, that on holidays and Sundays he would like to use the automobile for sporting purposes, for touring purposes, and therefore he prefers the gasoline car with its wider radius; even though it is less convenient, it can get to and from work and do legitimate business better. But this limitation does exist, and will continue to exist only so long as touring cross-country in automobiles remains a popular sport.

We have gotten out to where the situation changes, and in the sub-period the requirements of the automobile will be, not high speed, because very high speed is of no use in the interior of a city or in the suburbs where traffic conditions limit the speed to what would ten years ago have been considered excessive speed, but which we now consider moderate speed, namely fifteen to twenty miles an hour. Furthermore, there is no further advantage of high speed in service, because where the car is used to go to and from work, it is generally over a distance of say from one to three miles, and this at the speed of twenty miles per hour, the time consumed is from two to three minutes up to ten minutes. That time is so short that a minute or two saved would not be considered an advantage, since the time of getting ready is comparable with the time of taking the car out and putting it away at destination.

When you come to the care of the physician's car, the distance between patient and patient is rarely more than a mile, and that is two or three minutes of time. And this two or three minutes on the road between patients is negligible as compared with the time of seeing the patients. So no saving can be effected with the higher speed; and the higher speed means a greater disadvantage of strain in running the car. So the matter of high speed is dropping now into secondary consideration with the automobile in which legitimate business and social use is the main factor.

Furthermore, the mileage which can be made by the car is less, for even a busy physician in a day probably averages not more than ten or twenty miles, rarely more than twenty miles, though a mileage of thirty miles on one charge would probably satisfy the requirement of 90 per cent of all users. That means the two characteristics which gave the gasoline car the dominance—high speed and high mileage ceased to be of importance when the automobile dropped from a sporting appliance to a business commodity.

But essentially, then, you come to the ease and the simplicity of operation, and the fact that everybody can handle a car, so at the best a gasoline car, however

simple it is from the view of the automobile enthusiasts, we must realize that it means control of the ignition, control of the gear change, and control of the clutch—three controls in addition to the steering. Now, that is too much for the average man who is not an engineer to submit to, except when under the stimulus of the enthusiasm of a popular sport, and that is the disadvantage of the steam car; and there I believe the advantage is very decidedly with the electric, which has simply the starting and stopping, in addition to the steering gear. Then there is the question of reliability. The gasoline car requires to be taken care of. At present it is a sport. It is a recreation for the owner of the automobile that he can spend his holiday or part of it in playing with the engine and fixing and tuning it up, but if it were not a favorite sport, but merely the necessity of taking care of an engine belonging to a vehicle, then it would look very different.

As we saw in the case of the bicycle, the bicycle requires very little attention. Still the users of bicycles consider that it is a nuisance and an inconvenience to have to take care of it. So it means in a vehicle for business that we must have as much reliability as requires no attention. Here again the advantage is with the electric. And so with these conditions, where the automobile is ceasing to be the favorite popular sport, and settles into its permanent field as a most useful, a most satisfactory, a most generally used pleasure and business vehicle, the advantage will be most decidedly with the electric. And the gasoline car will practically disappear from this field.

There will remain a legitimate field for the large high-power gasoline car to travel across the country, to such places where the Pullman car on the railroad track does not go. To take care of transportation to places not reached by railroads. Then it will be the car owned by people very well-to-do who can afford it, in charge of a skilled, competent mechanic, who takes care of the car and drives it; but not the vehicle operated by the owner.

So you see, in my opinion, the future of the business and pleasure vehicle undoubtedly belongs to the electric.

Now, the characteristics which the electric car must have necessarily must differ from those of the present electric car. That is due to the limitation of its field by the dominance of the gasoline car, enforced by automobiling as a dominant sport.

Moderate speed—a maximum of say twenty miles an hour, and moderate radius, possibly say thirty miles, which will be practically sufficient for the day—recharging at night. This means a light battery, a correspondingly light structure, and a correspondingly light motor. It means a vehicle whose weight, inclusive of battery, is probably materially less than 1,000 pounds. It means a fitting up, not luxurious as the present electric, but plain and simple, of the same character as the present low-priced gasoline car, which is rapidly occupying the market. It means then a price not exceeding $500.

Now, with such an electric vehicle I believe there will be very little chance in the days of the decadent sport of automobiling for the gasoline car to compete. *And I have no doubt that in ten years, more or less—rather less than more—we will see the field of the pleasure and business vehicle covered by such an electric car in large numbers. And I believe I underestimate when I say that 1,000,000 or more will be used.*

But now coming to our side here, the electric central station, what would that mean to the station?—1,000,000 electric vehicles to be taken care of and supplied with power. Estimating 10 kilowatt-hours per charge; estimating that they are recharged every night, but in the average only one-half a charge, because I do not believe the average use is more than one-half the maximum radius. Then with 1,000,000 such electric cars it would mean about 1,500,000,000 kilowatt-hours a year, or, at the 5-cent rate, $75,000,000 of business; and that is a business of an excellent load factor, a steady load from six to eight hours.

More than that, it is a load where the time of power consumption can, with very little difficulty, be chosen by the station. That is, all that power demand can be placed into the off-peak period, into the night period, and it would mean an additional load on the central stations of the country of 1,500,000,000 kilowatt-hours without any practical additional investment, except charging sets. So that you see that, in my opinion, is a most profitable business which the future has in store for the central station.

Now, then, that estimate is based only on the pleasure and business vehicles to go to business with, to open up those suburban territories, not on the lines of the trolley cars and therefore preoccupied by the working population, but outside of the territory reached by the trolley, and which are being occupied today increasingly by the better paid middle class who can afford an automobile to go to the city and to work.

Outside of this, and in addition thereto, is the power demand of the electrical truck, the delivery wagon, from the heavy truck to the light electric tricycle, which is an enormous field which can be covered where already today the electric car successfully competes with the gasoline car because the limited radius and the moderate speed fit it to the nature of the delivery business or for the heavy trucking. *Now that will naturally become entirely the field of the electric car, due to lesser maintenance, charge and simpler control.* And in addition to those 1,500,000,000 kilowatt-hours it is probably another equal amount.

Now, how can this business be taken up by the central stations? One way would be to let the garage take care of the automobile charging. That I believe would be extremely undesirable, first, because it would delay development due to the inherent antagonism of the garage against the electric vehicle. Inherent, because a large part of the income of the garage is naturally and usually from repairs and supplies; and both are practically eliminated by the electric car. Furthermore, as central station men, we have to realize that the location of this power in the off-peak period is not feasible, or is much more difficult if the charging is done by a private garage, and not under the control of the central station, although with the increasing demand for electric power for charging we must realize that here if the private garages are left to take care of it the central station will meet again the competition of the isolated plant under conditions much more formidable than they met in the business building, because where the demand for power for automobile charging will be sufficiently large for the garage to install its own isolated plant, the main and most formidable objection to the isolated plant, namely that it requires skilled attention, and that the average janitor cannot properly operate it, and therefore it is uneconomical and unsatisfactory, now this objection will not exist, because the men met in the garages are those trained in the care of gasoline engines, and they

are the best class of attendants to take care of isolated plants. So to avoid again the competition of the isolated plant under this more severe condition than heretofore met, the central station must in the beginning take hold of this new business, and control it from the beginning, by making provision for taking care of this work for charging electric automobiles.

Now, there are various ways proposed. One is the fixed batteries, the central station exchanging the exhausted battery to the electric car against the newly charged battery. This is being done in the restricted territory, with a restricted number of automobiles, especially automobile trucks.

Again, I do not think that is feasible where you have to meet all kinds of batteries, and in all stages of perfection or dilapidation. The most promising method then appears to me to be the taking care of electrical maintenance of the automobile by the central station at a fixed monthly charge, say from $5 to $20 a month, whereby the automobile owner runs his car into the garage of the central station in the evening, and over night the charge is being made, or the charge completed, if it is still partly charged, and next morning the machine goes out freshly charged.

That appears to me in many respects the most promising plan. First, the average owner as a rule overestimates the power consumption. We realize when we have a 5-horsepower motor, running for fifty hours, that the power consumed is not 250 horsepower-hours, it is very much less, and we do not realize that a motor on an average does not carry its rated load except in rare instances, so that where the central station takes care of the charging of the automobile at a fixed rate, the experience will be that it will not be required to completely charge over night, but probably the average may be less than half charged.

Now, you see, assuming they charge every night during the month, this would mean, at the 5-cent rate, $7.50 a month for the charging. On the basis of $2.50, as an average, as interest on the storage shed, I believe it would be a very economical proposition to the central station to undertake the storage and charge the private electric automobile owner at the rate of something like $10 a month for both the storage space and the charging.

You realize what that means. A $10-a-month charge for the entire care of the automobile would make the electric automobile a reasonably cheap car, available to an enormous number of people, who can afford to buy an automobile but cannot afford to have a garage to keep it in, nor would they care to take care of it themselves, so that in itself would greatly extend the use of the electric automobile, but it would not help the gasoline car, as the latter is handicapped by requiring engineering supervisions, attendance, which is not necessary with the electric vehicle.

As regards the central station, you realize that while the average income from charging at such a rate of $10, assuming half charge every evening, would amount to 5 cents a kilowatt-hour probably in the average, the charge required per night is even somewhat less, and the rate for power received from the customer in the average probably will exceed 5 cents per kilowatt-hour than be below that amount, and still the charge to the customer would be lower than the amount for which a physician could keep a horse, or any man keep a gasoline car, or take care of it in any way, so that it would be a very profitable arrangement for both interests concerned.

Now, the average central station, for off-peak power, would require no additional investment beyond the charging set, which is very moderate, and the average cost of such power certainly should be, if anything, less than one cent per kilowatt-hour. At the average selling price, figuring at 5 cents or more, you see in this plan $75,000,000 worth of additional business; or rather, $60,000,000 would be available as additional central station profit, so that I believe it is well worth while for the central station to give that matter careful consideration. Put your house in order and keep in view the getting control of this business while it is still in the very beginning.

Pittsburgh Section Activity

To the seven local sections, New England, Chicago, Philadelphia, Washington, Cincinnati, San Francisco and Los Angeles, already existing, the Pittsburgh section of Electric Vehicle Association was added a few weeks ago. The formation of the latest section of the E. V. A. was the result of splendid co-operation of local electrical interests, in which the Pittsburgh Electrical League took the initiative.

The Pittsburgh section has perfected its organization and has elected the following officers:

W. A. Donkin, chairman, Duquesne Light Company, 435 Sixth avenue, Pittsburgh; T. H. Schoepf, vice chairman, Westinghouse Electric & Manufacturing Company, Box 911, Pittsburgh, Pa.; J. A. Jaques, secretary, Western Electric Company, Box 42, Pittsburgh, Pa.

Charles A. Ward of the Ward Motor Car Company of New York, gave an unusually interesting paper, "The Electric Commercial Vehicle versus the Horse," which contains very valuable comparative operating cost data, showing that the electric vehicle, irrespective of mileage is cheaper to use than the horse. (This paper appears in full on other pages of this issue.)

In the discussion following the paper, G. L. McCullough of McCreery & Company brought out the point that carefully arrived at figures showed that for equal work the electric vehicle costs about one-half that of the gasoline car. These results were deduced from a mass of data obtained from electric and gasoline car performances in actual service in one of the hilliest cities of the country and are therefore particularly gratifying to electric vehicle interests.

G. M. C. Completes Additions.

The General Motors Truck Company of Pontiac, Mich., has recently completed some valuable additions to its equipment. Although the factory is accessible to the city water mains and is equipped with a sprinkler system, the company has installed a 100,000-gallon reservoir as an added protection against fire.

A number of new cement floors have been put in the factory and several thousand dollars have been expended in rearranging storerooms and other equipment to facilitate the handling of business, which the company states is growing rapidly. In addition to improvements in the factory itself the company has, at its own expense, paved two blocks of street leading from the main thoroughfare to the factory.

The factory force has been largely increased during the past sixty days and the company officials say that everything indicates that 1914 will be the best year in the company's history.

Chicago's Exclusively Electric Truck Garage

A Departure in Garage Service for Improving Charging and Repairing of Electrics

BY FRED B. SCHAFER

THE steadily increasing adoption of electric commercial vehicles in Chicago has been responsible for the opening of an exclusively commercial electric garage and repair shop equipped with facilities which offer to Chicago truck users an improved service not only in regular garage storage, but more especially in expert charging and immediate repair service of the highest quality.

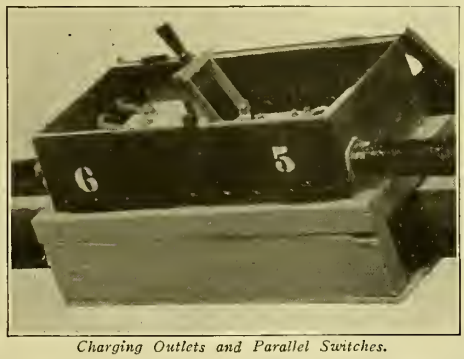
The new enterprise is the only electric truck garage in Chicago officially recognized by the Electric Vehicle Association of America and will be somewhat of an innovation to electric truck users especially in view of the fact that since the adoption of electric trucks, it was found necessary formerly to house these vehicles either in garages catering to gas trucks, or else in electric garages equipped to take care of electric passenger cars only. In the first case gas car garages employ assistants who are inexperienced in the proper care of the electric type, and in the latter case the facilities are insufficient to charge and repair electric trucks properly. In the electric passenger garage practically every spare moment is consumed in caring for the many details peculiar to the passenger type. Consequently the truck is merely a side issue demanding more time and space; purely an accommodation.

Electric Service Garage, Chicago. Located in the Center of the Heavy Traffic District.

In this new exclusively electric commercial vehicle garage, where only those are employed who are familiar with electric trucks, every attention will be devoted to receiving the vehicle, charging or repairing it, and placing it again in satisfactory operation.

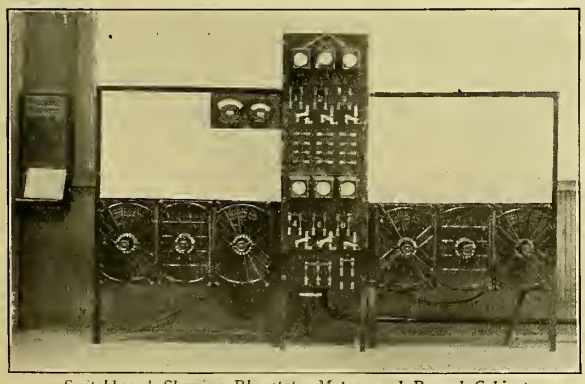
Located at Halsted and Fulton streets, in the heart of a heavy traffic district, the garage is properly situated to take care of the many electric trucks plying between the downtown district and the north and west sides of the city, many of the trucks delivering and receiving at the nearby railroad freight depots.

Easily accessible from the street, and also the shipping yards of the railroad terminals, the building is so divided that the garage proper extends the extreme length of the building, the machine and repair shops being located on a balcony above, to which trucks, bodies or chassis can be easily removed by means of an electric hoist. This modern facility means much in making repairs. In the average garage, removing a body or heavy part is a phase of repair work which is often avoided, thereby leaving the damaged part inaccessible. In such instances the vehicle is kept out of service for an indefinite period because of this inability to handle ton weight by ordinary methods.

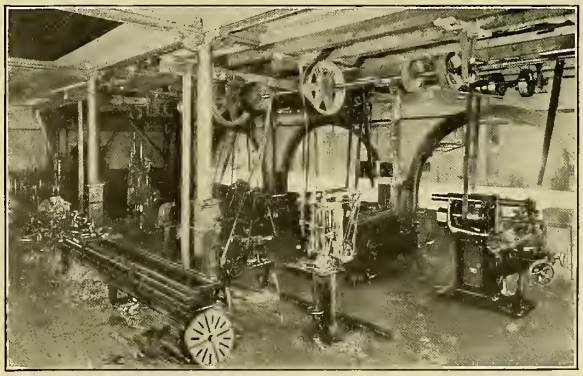


Charging Outlets and Parallel Switches.

The balcony platform is equipped with a specially built switchboard, the rheostats and wiring being of extra heavy quality in order to carry a large amperage. As shown in the illustration, the board has six rheostats and six meters. Each meter is so connected as to indicate the kilowatts used for charging, the charging expenditure being based absolutely on a flat rate of five cents per kilowatt hour consumed.

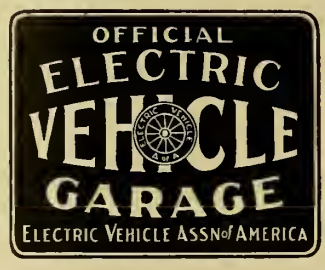


Switchboard Showing Rheostats, Meters and Record Cabinet.



Machine Repair Shop.

In order to assist truck users in avoiding delay while charging, it is possible to connect the charging outlets in pairs; two outlets in each outlet box, each box provided with a double pole knife switch so that each pair of charging outlets may be connected in parallel to give boosting charges of 160 amperes. This fast and heavy boosting is exceedingly valuable. Truck drivers can drop in at any time, especially during the noon hour, and place their vehicles on a quick, heavy charge sufficient enough to last them for the rest of the day. The charging plugs are located and extend along the edge of the balcony and are easily accessible to the trucks below.



Sign Adopted Officially by the Electric Vehicle Association of America.

As soon as the vehicle has received a sufficient charge, a reading is taken from the meter. This reading, the former reading, and the kilowatts consumed are recorded together with the mileage, type of truck, tire and battery equipment, on a blank card bearing the owner's name and address. Each card is tacked to a drawer and acts as a separate file when placed in the cabinet, as shown to the left of the switchboard in the illustration. At the end of the month a bill is rendered, the data on the card report showing the exact work done, and the cost of the month's operation. By the use of this unique method, the truck user has a permanent record from which he can estimate the saving or loss arising from his vehicles.

The remainder of the balcony is reserved for repair work and assembling. The vehicle repair shop is located just adjacent to a modern splendidly equipped machine shop which has facilities to duplicate and replace any part on the shortest possible notice. The interests of the machine shop are in conjunction with those of the garage. Consequently machine work on repairs will be given immediate attention. The average garage when confronted with repairs demanding special equipment to construct, finds it necessary to send the broken parts to similar machine shops or even back to the vehicle factory. The vehicle remains out of service with a loss to its owner. In this new establishment repairs of any nature can be made accurately and of the best quality in material. The middleman's profits are eliminated and the total expense is reduced to a minimum; and loss of time entirely avoided.

All of the machinery in the garage is electrically propelled. The general lighting scheme is excellent and from all aspects the new undertaking promises a real benefit to Chicago electric truck users. During the last few years the truck users and central stations have realized the necessity of such an undertaking. Present garage methods and prices have been detrimental to the progress of the business. Inexperienced charging and repairing has caused the vehicles to depreciate too rapidly to be a worthy investment.

To overcome this situation, manufacturers have established their own service stations where the vehicles could be repaired or inspected at reasonable charges.

Yet it is hardly reasonable to expect the average electric garage to carry an equipment aggregating thousands of dollars merely to have such facilities on hand should the occasion arise for "fixing up" an electric truck. The present number of electric trucks in use would not warrant such investment. Their principal revenue arises from storage of passenger electrics and the commercial vehicle has always been the "extra," demanding a greater space and usually causing considerable congestion. Hence this new garage with its ideal location and equipment should be a busy center for the crippled electric or for a quick heavy "boost" by those who understand charging and its relation to the battery. It represents a new development and asset in the industry; an added feature in overcoming delay and keeping the vehicle in service more days in the year. And continuous service is the necessary feature in securing both reliability and economy.

Six Models of Woods Electrics

Riding down Main street in an enclosed electric automobile with a smoothness that always brings pleasure to the lover of travel, little thought is given to the many things that go to make up the work in the manufacture of the machine for the market. A mere observer never takes into consideration the work that is behind the building of a modern electric runabout and their attention is not drawn to it until they chance to pick up a story of it.

The Woods Motor Vehicle Company, manufacturers of Wood electrics, which are handled in Houston by Young & Dwire, has issued from their offices a bulletin or catalogue which gives some idea of how an electric is built. Beginning with the car, crude as it was, which was built in 1896, the booklet carries the reader down to the present day when an electric is considered almost a necessity for the lady shopper or the busy woman who has many calls to make and but short time in which to make them.

Six models of the Woods electrics are now on the market. These cover the range from a five-passenger car to the roadster for the busy business man. Different finishes and different equipment makes for this car the variety which is now much sought by Americans.

In 1896 when the first cars were brought before the public, only one model was to be taken. It was a case of take it or be without an automobile. Today there are styles upon styles from which to choose.

The mention of the word "electrics" brings the first thought to the mind that these cars are for the exclusive use of the ladies. An examination, a little research and observation, however, brings a person face to face with the reality that they are for the business or professional man as well as the ladies. Compact, smooth running, easy to manage and other countless details gain favor for the electric car over the gasoline machine.

A Woods electric bulletin gives many facts of interest about this industry and brings out many facts and is well worth spending time to study.

The Fashion Auto Station of Chicago has dispensed with gas cars and will again be known as an exclusive electric garage. The business and property of Electric Auto Sales and Rental Company, formerly at Forty-Sixth and Cottage Grove avenue, has been acquired by the Fashion, and 75 used electric cars will be disposed of.

The Electric Commercial Vehicle vs. the Horse

Statistics Proving Economy of the Single Electric Over the Single Horse Regardless of Mileage

BY CHARLES A. WARD

THERE is doubtless none of you who has not at one time or another been visited by that pest—or god-send, as the case may be—the electric vehicle salesman, of whom you have asked after much talk—that final and, to you, all important question—"Why an electric?"

You have been told in reply that electrics are durable, reliable and economical. True! electrics are durable; no one will dispute the fact for scores of electrics still run in regular service that were installed more than ten years ago, while many, many more could be run were it not for the fact that the more efficient machines of later years make it more profitable to lay aside the earlier type because of the greatly increased earning capacity of the present vehicle. Certainly then you believe them durable and let me add this one word for those whose belief still borders on that of skepticism, that an electric will last as long as the owner will provide it with necessary running repairs.

But you say, and rightly so, are electrics reliable?

Before going further, what is reliability? Reliability, we are told is that element in any piece of apparatus that makes it possible to depend upon that apparatus for the performing of its various functions a high percentage of the time at which such demands are actually made of it.

Is the electric reliable? Almost without exception owners of electrics will tell you that they are, and the writer has personal knowledge of a reliability factor as high as 98½ per cent in a very large installation and during the winter period of the year. There are many cases of electrics in commercial service that have operated for months at a time with nothing more than a charge, an occasional oiling and few adjustments. The best answer to such a question is always found with those firms whose very prosperity and life depend upon the regular and prompt delivery of their merchandise, and the express companies, baking companies and department stores are only some of the more important examples.

You have been assured then of the durability and the reliability of the electric. But how about their economy? For you say, and justly so, that even though electrics are both durable and reliable, I cannot afford to buy, much less use them, unless they will enable me to reduce my delivery expense. And let me emphasize for you this last factor by making this broad and comprehensive statement; namely, that you not only cannot afford to use electrics unless they will reduce your delivery expense, but you have no right or business to use them unless that use means a real economy to you and something that can be measured in dollars and cents.

Let us see then whether or not this last acid test can be given with safety to the electric vehicle and whether it will withstand this test under every condition of use, for if it does, you will be obliged to reach this conclusion; namely, that the best time to sell your horses is now while the market is good, and the best time to buy electrics is now so that you may the sooner reap the saving in delivery expense that is in store for you.

Before passing to the next division of the paper, let me say that the value of the electric vehicle from an advertising standpoint will not be considered as an asset although there is undoubtedly a very good advantage in their use in this respect in such lines of business as those of caterers, bakers, butchers, and in fact any business involving the handling or haulage of foodstuffs.

In the cost comparisons which I hope to show later, let me say that in the cases of both the electric vehicle and the horse wagon, every item of expense has been considered except operator's wages. This has been omitted for the reason that in each case here analyzed this item has been considered as a selling and not a delivery expense.

First then, what does it cost to operate electric vehicles? Let me answer this question by showing you in table Number 1 the complete costs of two large fleets of electrics; the average of which has been taken over a period of more than two years and where, as I said before, every item of expense has been considered except operator's wages.

To get quickly to the root of the matter, you will note under plant "A" that the cost per route per year is $913.60 while in plant "B" the cost is $952.21. An average of these two figures shows $932.95 as the cost per route per year covering the electrics in question.

Let me now show you table Number 2 whereon is shown the operating costs for horse vehicle routes in a similar line of business and in cities extending from New England to the Middle West.

If you will note again the cost per route per year you will find these figures varying all the way from $1,060.80 to $1,337.65 per route per year for the horse vehicle equipment. If again we average the five sets of figures in question here we will obtain $1,210.45 as the cost per route per year covering horse vehicle operation, or an average saving of $277.30 in favor of electrics.

The Wornout "Plug."
Walt Mason.

As I go drilling through the town I see old horses, broken down, poor, friendless and abandoned plugs, still straining feebly in their tugs, to haul big loads beyond their strength, and hoping death will come at length. Ah, what's more pitiful than these, the worn out nags with broken knees—and broken hearts as well, no doubt—their ribs, all fleshless, sticking out, with shoulders sore and tortured eyes, where gather fifty million flies? When they were young and fat and strong they labored blithely all day long, or on the pike like Maud S. raced—they did their best, wherever placed. Then there were hands to stroke the necks of these poor man-forgotten wrecks, and they were groomed and manicured, and lives of comfort seemed assured. But when the vim of youth was o'er, and they could caracole no more, like outcasts they were chased to die at least six deaths a day. No kindly rifle ends life's storm; no friendly dose of chloroform. They'll bring a few dishonored yen, so send them to the dinky men! Whene'er I see a poor old steed, sad eyed, despairing, broken kneed, I think: "The man who wore him down should haul his burden through the town!"

If for the moment we return to plant "A," table Number 1, where they operate 101 electric routes this means an actual annual saving of 101 times $277.30, or $28,007.30 in delivery expense to say nothing of a cleaner delivery method.

COMPARATIVE COST STATEMENT BETWEEN ELECTRIC MOTOR WAGONS AT PLANTS "A" AND "B."

	Plant "A."	Plant "B."
Labor	$ 21,776.51	$ 20,710.32
Batteries and supplies	8,734.81	8,369.23
Repairs	14,428.08	19,884.62
Insurance	7,650.00	8,222.16
Taxes	272.53	322.53
6% on investment	14,008.20	14,587.77
Depreciation (buildings 1%), automobiles	18,664.29	18,680.53
Power (estimated), 1½c per k. w. h.	6,739.20	7,300.80
	$ 92,273.62	$ 98,077.96
Average number autos	121	130
Average number routes	101	103
Average number autos per route	1,198	1,262
Average cost per route per year	$ 913.60	$ 952.21
Investment—Land	16,736.44	17,209.54
Investment—Buildings	34,017.17	37,287.17
Investment—Automobile	182,716.47	188,632.75
	$233,470.08	$243,129.46
Average investment per route per year	2,310.59	2,360.48

The period covered by the above report was over two years.

There must be something wrong you say; such figures are amazing, they cannot be right. Let us see:—

In the first place let me state that the average mileage for the electrics given in table Number 1 is practically 25 miles per day for each route, while the average length of the horse route in table Number 2 is just about the same.

COMPARATIVE COST STATEMENT BETWEEN HORSES AT PLANTS "C," "D," "E," "F" AND "G."

	Plant "C"	Plant "D"	Plant "E"	Plant "F"	Plant "G"
Horse expense	$ 2,668.38	$3,608.57	$4,106.60	$3,984.91	$6,912.88
Wagon expense	2,172.07	3,861.56	5,473.40	501.26	7,287.27
Harness expense	542.54	720.91	1,504.70	470.20	952.98
Stable labor	4,168.63	8,443.94	5,916.26	5,892.42	9,783.05
Feed	8,462.45	13,127.41	15,606.33	13,577.72	17,137.78
Stable sundries	1,049.45	1,873.81	1,889.78	1,176.13	2,444.29
Depreciation (10% on wagons and harness, 1% on land and buildings)	919.98	1,462.38	1,396.90	1,557.97	1,405.22
Taxes	717.96	868.99	1,512.98	1,613.26	711.00
Insurance	102.26	117.08	120.27	237.07	470.00
6% interest on inv't.	2,772.71	3,926.24	3,661.71	5,768.02	1,692.15
Total expenses	$23,576.77	$38,010.89	$41,188.93	$34,778.96	$48,796.62
Av. No. wagons	28	32	44	25	75
Av. No. horses	47	80	64	63	96
Av. No. horse wagon routes	20	32	32	26	46
Av. No. horses per route	2.35	2.5	2.	2.423	2.087
Av. cost per route per year	$ 1,178.83	$ 1,187.84	$ 1,287.15	$ 1,337.65	$ 1,060.80
Av. invest. per route per year	2,310.60	2,044.92	1,907.14	3,697.45	613.10
Investment — Horses, wagons and harness	25,560.89	24,014.31	17,628.86	21,157.99	27,350.68
Land and buildings (estimated)	20,651.01	41,423.07	43,409.58	74,975.66	851.82
Total investm't	$46,211.90	$65,437.38	$61,038.44	$96,133.65	$28,202.50

The period covered by the above report was over two years.

Secondly, you will note that the average number of horses per route varies from 2 in plant "E" to 2.5 in plant "D."

A lot of useless spares you will say, eating their heads off and not doing any work. No they are not, for it takes two horses to every single horse wagon, the average daily mileage of which is 25 miles; and more than this where the routes are hilly or the roads bad. Expert horsemen will tell you, and tests I have made have shown, that a single horse in a single horse wagon cannot average more than 17 miles per day without undue depreciation, either physically or commercially. Two horses in a single horse wagon can average daily not more than 25 miles under similar conditions.

But you say, "My routes are short. I only average a little more than one horse to a single horse wagon and my horses are in the pink of condition. Electrics would be of no value to me. I could not make them pay."

Just here let me make this very important statement and one which I will attempt later to prove; namely, that "a single electric against a single horse wagon can do the same work for less money *regardless* of the mileage."

"I have shown you beyond contradiction, I believe, that the electric had the horse beaten on routes averaging 25 miles or more. Did you ever stop to think what horse expense stopped when the horse did no work but merely stood in the stable? He eats almost as much when idle as when working. He requires nearly as much care. Interest, depreciation, taxes, insurance, shoe and veterinary bills go on just the same. In fact it costs you very nearly as much whether he works or not. Think now what happens when an electric stands idle. Repairs to mechanism disappear at once. No care is needed, no current is necessary for charging and only slight depreciation appears in tires and battery to such an extent that it is actually cheaper to keep a single electric standing than it is a single horse and wagon. This is nicely brought out in the curve shown on sheet No. 3, where the comparison in cost in dollars per year is shown between the electric and the horse for various numbers of average miles per day from 0 to 34. You will note that when both electric and horse are idle there is shown a saving per unit of nearly $140.00 per year. This saving gradually decreases when both are used up to a point at which the horse is doing his limit of 17 miles per day when suddenly the curve shoots up to nearly $350.00 per year as a saving as soon as the 17-mile limit is exceeded. From this point on to 34 miles per day where both horses are working their full limit there is then shown a saving of approximately $200.00 per route per year in favor of the electric.

If then, we draw a line between the two extreme points of the horse vehicle curve and a point P bisecting line $5, 5'$ we will have a fairly accurate representation of the horse vehicle cost curve for various average daily mileages.

Also note that there were we to continue both horse vehicle curve and electric vehicle curve to the left and past the zero point they would apparently meet at negative values for both "cost in dollars per route per year" and "average daily mileage," or in other words, the cost for horse delivery and electric vehicle delivery is the same, *only* under imaginary or impossible conditions.

HORSE VEHICLE AND ELECTRIC VEHICLE COMPARISON.
0 to 34 Miles.

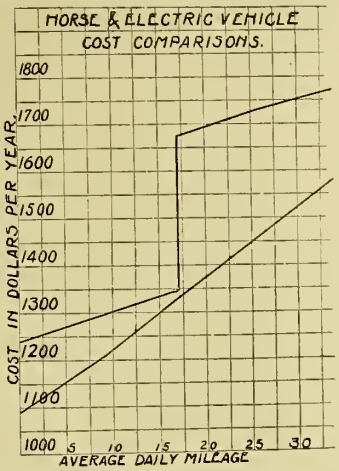
Column No.	1	2	3	4	5	6	7	8	9	10	Extra
Cap., 1,000 lbs.	H	E	H	E	H	E	H	E	H	E	Horse
Radius	0	0	8½	8½	17	17	25½	25½	34	34	
Speed	6	10	—	—	—	—	—	—	—	—	
Price	$650	1,650	....	....	....	....	....	....	....	....	....
Rep. & paint	....	....	$32	$41	$65	$82	$97	$123	$130	$165	....
Shoes and vet.	$ 25	....	35	....	45	....	80	....	90	....	25
Tires (4 yrs.)	....	22	....	38	....	54	....	70	....	86	....
Batt'y (6 yrs.)	....	50	....	75	....	100	....	125	....	149	....
Current	....	12	....	35	....	70	....	105	....	140	....
Feed & bed'g	180	....	200	....	220	....	420	....	440	....	180
Garage	....	80	....	90	....	100	....	110	....	120	....
Stable	180	....	180	....	180	....	270	....	270	....	90
Driver	750	750	750	750	750	750	750	750	750	750	....
Depreciation	65	127	65	127	65	127	90	127	90	127	25
Interest	20	50	20	50	20	50	27	50	27	50	8
Insurance (fire and liability)	....	....	....	....	....	....	....	....	....	....	....
Total	1,220	1,091	1,282	1,206	1,345	1,333	1,734	1,460	1,777	1,587	328

Extra horse 328
Total, 2 horses, 1 wagon, $1,673

"H"—Horse. "E"—Electric.

But, you say, and your question is a fair one, where are the figures from which the above were compiled,

and in answer to this let me show you sheet Number 4 having 10 columns of figures, each column numbered and totaled and corresponding with a similar number on sheet Number 3.



Column Number 1 contains all the horse vehicle costs (and in this particular comparison drivers' wages have been included) for a single horse and wagon when standing idle but ready to do service. Column Number 2 contains similarly all the fixed operating and maintenance charges for the electric vehicle when it is also standing idle. The totals of each column are then used to get the first points respectively for the horse vehicle and electric vehicle cost curves and shown on the curve sheet previously referred to. As above stated, the mileage radius in the first case is zero, or in other words both horse and electric are standing idle. Before leaving column Number 2 let me call your attention to this fact; namely, that I have charged against the electric $22.00 for tires, assuming that these will actually be worthless in four years even though they are not operated a single mile. Similarly, I have charged against the battery item a figure of $50.00 annually for nothing more than gradual depreciation due almost entirely to age.

Points 3 and 4 were then taken at 8½ miles on account of their being half way between the zero limit and the maximum limit of 17 miles for the single horse wagon. Obviously the remaining points were taken at 17 miles, 25½ miles and 34 miles per day.

For convenience all the way through, the so-called garage charge and the stable charge have been apportioned largely on the basis of a square foot charge, although I have actually obtained figures from livery stables in New York based on storing and washing an electric vehicle in service as low as $7.00 per month exclusive of adjustments and current, while the maximum figure quoted was only $10.00 per month for the same service.

Let me also state that these figures were obtained from livery stables where $30.00 per month was charged for storing a single horse wagon and storing and feeding the horse. Please note also the cost figures under the heading of "extra horse" in the last column and the total of which cost figures, $328.00 was used when the horse vehicle curve on sheet Number 3 took the sudden jump after the 17-mile limit was reached.

It is only fair to say that these costs represent both horse and electric when operated under favorable conditions and barring accidents and with fire and liability insurance omitted on account of the great variation in different localities. However, these figures, and the curve on sheet Number 3 representing their relation to each other, prove conclusively along with the actual cost figures given on sheet Number 1 and 2 that a single electric against a single horse wagon can do the same work for less money regardless of the mileage.

Advance of Electric Motor Trucks

On Tuesday, June 23, the Electric Motor Car Club of Boston held its annual field day at the East Braintree Kennel Club. While the afternoon was given up to sports and little thought was given to business, the object of the club and the success of its work was brought home to the club members and its guests by its president, Day Baker, when in the course of his address of welcome he said, "Some idea of the work of the club and of the growth of the use of the Electric Motor Vehicle for business purposes, may be gained by just glancing at two of what might be termed electric vehicle centers.

"One of these is located in the heavy trucking district of Boston, within practically a half-mile radius of the South Terminal Railway Station. Here we find one installation of one 1,000-lb., two one-ton, thirty-five two-ton and four three and one-half ton electric trucks, all used for express service; two five-ton trucks used by the New York, New Haven & Hartford railroad for conveying broken lots of freight around the freight yards; three five-ton electrically operated dumping trucks for carting ice on the fish piers; two great five-ton machines for delivering gasoline; a 1,000 lb. delivery wagon, a three and one-half and a five-ton truck for the haulage of confectionery; a four-ton pipe hauling truck; five five-ton coal trucks; two trucks for hauling sugar, one a five-ton and one a six-ton; two two-ton trucks used in the wholesale milk business; a one-ton in the coffee business; a half-ton for the delivery of engravings and electrotypes; one delivering provisions; a two-ton truck for the delivery of electrical machinery and two baggage and mail trucks used in the South Terminal. In this same district there also comes almost daily four trucks of the three and one-half ton size loaded with chocolate; and two trucks loaded with stocking supporters. This makes a total of seventy-four electric motor trucks in use in the South Terminal district.

"The other particularly noticeable electric motor vehicle point is the Roxbury district. Here gather the great Edison electric fleet consisting of three five-ton trucks, one three and one-half tonner, eight two tons, eight one tons, twenty-two half ton capacity, sixteen light delivery wagons, and twenty-four patrol and department vehicles, a total of eighty-two electrics in all.

"But the Edison Company does not monopolize the Roxbury district in the electric motor truck field, for in addition to its fleet will be found seventeen five-ton trucks used by the brewers, two by a stocking supporter manufacturing company, a three and one-half ton truck for transporting piping tools, a hospital ambulance, and a little electric truck for quickly delivering hot food from the kitchen of the hospital to the patients. This gives a total of one hundred and four in the Roxbury district, or a total of one hundred and seventy-eight in two electric motor vehicle centers of Boston. A record of which this club and its members may well be proud, and one which every thinking business man who has delivery and transportation work to be done may well ponder, for these electric trucks have been installed, not on account of any fad or fancy, but because the electric does the work required better and more economically than other forms of transportation."

Washington Holds Sociability Run

Under the auspices of the Washington section of the Electric Vehicle Association of America the first electric automobile sociability run was held May 27, with fifty-four electric cars entered. The run started in front of the main entrance to the Smithsonian Institute and the fourteen-mile course was laid out through the Speedway and Rock Creek Park, the finish being made at the Joaquin Miller Cabin, where a basket luncheon was served. The run was a sealed time affair, each contestant endeavoring to cover the fourteen miles, observing all traffic and speed regulations, within a secret time selected by a prominent government official.

The course was covered in one hour, 15 minutes, and 30 seconds, and the prizes were donated for the event as follows:

Washington section of the E. V. A., silver picture frame; Emerson & Orme, silver cup; J. J. Bartram,

Enroute in the Sociability Run.

electric teapot; Dupont Garage, automobile clock; United States Tire Company, inner tube; Potomac Electric Power Company, electric chafing dish.

Standardization of Tires

Endorsing the action of the S. A. E., which urges the limiting of solid tire sizes for motor trucks and motor fire apparatus to diameters of thirty-six and forty inches, F. H. Sawyer, manager of the fire truck tire department, the Goodyear Tire & Rubber Company, explains how such an elimination plan should benefit all concerned. Viewing the matter from an economic standpoint, Mr. Sawyer states that to the manufacturer of motor vehicles this simplification insures a lower cost and more prompt filling of orders, for where the demand is confined to a few sizes the production is more uniform and orders are filled more promptly and satisfactorily.

The user is assured of a constant tire supply from the local branches or agents of tire companies. At present there is often difficulty in promptly obtaining tires for a car equipped with what may not be a popular size in its locality. With two diameters as standard sizes this trouble will be ended.

To rubber companies it means simpler manufacturing processes. Unit costs on a few tire sizes made in large quantities will naturally be lower than unit costs among a large variety of sizes. An elimination of many sizes will finally permit the tire people to sell their product for less to manufacturer, dealer and user of motor vehicles.

Mr. Sawyer also shows that the necessary engineering changes for car manufacturers will be small. By figuring on the maximum charges it is found that the mechanical operation of the car is effected only a small per cent.

Electrics Scarce in New Orleans

"I was greatly surprised," said Mr. de Mange, of the Rauch & Lang Carriage Company of Cleveland, O., now connected with the Fairchild Auto Company, "at the very few electric carriages now in use in New Orleans, as it is undoubtedly the logical town for these cars, the absence of grades giving excess mileage, and the extent of the city seeming to call for a quiet, comfortable, clean car of this type.

"I attribute this scarcity of electric cars greatly to the fault of the electric carriage manufacturers, as on account of New Orleans' rather isolated location and distance from manufacturing centers they have either totally neglected it in their selling campaigns or have only tried to develop it in a haphazard manner. The electric car has not had a fair representation in New Orleans, as it is my belief that the local dealers who have handled it have concentrated the bulk of their efforts on the sale of gas cars; the factory representatives who have come from the different manufacturers have been kept here but a short time, no educative advertising campaign has been entered into, and the service for charging has been in many cases most unsatisfactorily attended to. The battery service is the vital feature of an electric car; if proper attention is given to this an electric carriage will be found to be the most desirable, and in fact the most practicable, economical and trouble-proof town car built.

"I find a great deal of prejudice in New Orleans against electrics, owing to the fact that the people there have formed their opinion of these cars from the few obsolete old model cars which have been sold here from three to four years ago and have never been given the proper service or attention. In the last two years, particularly in the last year, tremendous improvements have been made in both the electric carriage and storage batteries, and it is now only necessary to obtain the consent for a demonstration from any prejudiced party to convert him from a scoffer to an enthusiast."

Boston Electrics Increase

Since the Edison Electric Illuminating Company of Boston began its vehicle campaign three years ago there has been an increase of 250 per cent in the number of electrical commercial vehicles in Boston, while the number of electric passenger cars has increased over 110 per cent. The number of cars and garages in Boston on January 1 was 463, there being 208 commercial cars, 255 passenger cars and 185 garages, as compared with 50, 117 and 57, respectively, on January 1, 1911. The Edison Electric Illuminating Company of Boston operates the largest fleet of cars, the express companies have nearly fifty trucks and the coal companies more than twenty. The breweries also operate more than twenty trucks. In every instance the vehicles are showing economical operation.

ELECTRIC VEHICLES

Published Monthly by

ELECTRICITY MAGAZINE CORPORATION

Monadnock Building, Chicago

Telephones: Harrison 3014—Automatic 61028

New York Office, 1022 Longacre Building, 42nd Street and Broadway.

Ed. J. Mock and Paul H. Woodruff, Editors

Fred B. Schafer, Associate Editor.
Allen L. Haase, Advertising Manager

Entered as second-class matter January 22, 1912, at the postoffice at Chicago, Illinois, under act of March 3, 1879.

TERMS OF SUBSCRIPTION

United States, Cuba and Mexico	Per year,	$1.50
Canada	Per year,	1.75
Foreign countries within the Postal Union	Per year,	2.00
Single copy		.15

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office of publication not less than ten days in advance of date of issue. Regular date of issue, the first day of each month. New advertisements will be accepted up to within five days of date of issue, but proof of such advertisements can not be shown in advance of publication.

NOTICE TO SUBSCRIBERS

Remittances—Remittances should be made by check, New York draft or money order, in favor of Electric Vehicles. Foreign subscriptions may be remitted direct by International Postal Money Order.

Change of Address—The old address should be given as well as the new, and notice should be received two weeks in advance of the desired change.

This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in Electric Vehicles *or any voice in its management or policy.*

CHICAGO, JULY, 1914

TABLE OF CONTENTS.

WHAT IS A TRADE PAPER?

EVERY industry of any importance whatever has at least one trade paper. Very few have less than two. Some industries are so large that their trade papers must subdivide them into specialized subjects. Thus the electrical business at large has trade papers which concentrate their efforts on electric lighting and power, electric railways, telephones and telegraphs, electro-chemistry, and electric vehicles.

These divisions and specializations are quite necessary, since the clientele of each field is different. Those who are interested in electric lighting are not particularly concerned with electro-chemistry, or with gas lighting, which has its own trade papers. Telephone people are not interested in electric railways, nor electric railway people in steam railways. And persons who find a knowledge of electric vehicles necessary or desirable care nothing for electric lighting news or for gasoline vehicles, which also have their own journalistic exponents. It is obvious that electric lighting and gas lighting could not be handled satisfactorily in the same trade paper, for electric central stations do not make gas and would object to paying for paper and ink and brains intended for the edification of gas plant men—and *vice versa*, of course.

Similarly, it is impossible for a paper devoted to gasoline vehicles to serve the electric vehicle business by giving a few pages of each issue to the subject. For there is absolutely no point of similarity between gas cars and electrics except that each has four wheels and carries passengers or freight. The electric vehicle, the gasoline vehicle and the horse-drawn vehicle form an equilateral triangle. Their points of difference are far more important than their points of similarity.

The gas car field has proved its need of a trade paper by supporting several of them in generous style. If the gas car needs a paper, the electric assuredly does. For the gas car has gained public approval in large measure; the electric so far has gained it in very small measure and is still struggling.

The electric vehicle industry, considered by itself is big and prosperous. Considered in comparison with the gas car industry, it is a joke. The gas car census for the United States is over 1,200,000. The electric car census is around 35,000. There are almost as many cars as that in Chicago alone.

The electric vehicle never had a trade paper until this publication entered the field. The industry has been at the editorial mercy of those who represented the rival gas car, who were supported generously by the gas car people and had nothing to gain and everything to lose by boosting the electric.

Yet one of the manufactrers of electrics said the other day that the electric vehicle did not need or want a trade paper. We can only characterize that remark as typical of the spirit of non-enterprise that has so retarded the development of the electric.

Fortunately for the industry it is not all of one mind on that subject. For any student of business progress will agree positively that a full-grown, man-size trade that sees no need of a trade journal must be anemic and debilitated, and so inevitably inefficient.

The trade paper is the only possible means by which the various branches of a trade are kept in touch with each other all the time. It is the great agency of cohesion which makes an industry a unit instead of a scattered, heterogeneous mass of fac-

tories, dealers, agents and buyers. The advertisements of all its manufacturers gathered together under one cover do more to establish the solidity, permanence and importance of the industry than bushels of individual catalogs and circulars could ever accomplish.

The popular magazine of national circulation offers to its advertisers nothing but that circulation, to which it cannot dictate editorially or carry any special message for the advertiser. It cannot even guarantee that a reasonable proportion of its circulation is interested in the thing advertised. It may be presenting automobile advertising to hall-room boys, and suspender publicity to ladies.

Trade paper management makes sure that every copy of the paper goes to some one interested. That is why trade paper advertising is the only 100 per cent advertising. But far more important than the mere concentration of circulation is the *service* of the trade paper to its advertisers—a feature that many good business men have never even thought about. The unbiased descriptions of new points of advantage in the advertiser's product; the discovery of casual prospects which are turned over to the manufacturers for development; the general enthusiasm and "hurrah" for the good of the cause; all these are worth far more to every advertiser than the cost of his support.

For the publisher of a trade paper is a joint employee of all the trade; that is his primary function. All his staff spend their time in the service of all his advertisers; and the payroll for this service, as the manufacturer meets it, is less than the wage of one girl clerk.

If ever an industry needed that kind of service, the electric vehicle industry needs it now.

ONE MILLION ELECTRICS IN TEN YEARS.

ONE million electrics in ten years" is the prediction voiced recently by Dr. Charles Proteus Steinmetz, electrical expert of international renown. So radical and sanguine a forecast has naturally irritated the editorial exponents of the gas car trade into much refutatory argument. Authoritative announcement of the ultimate elimination of all types of vehicle but the electric is well calculated to create consternation among the friends of the 1,200,000 gas cars now in use in this country.

Yet in every use of applied power electricity has already supplanted all other forms of energy. Present installations of other motor types are only awaiting the expiration of a reasonable obsolescence period to substitute electric power. The learned doctor has watched the disappearance of various sources of energy and the survival and growth of the electric. And all the forces of industrial history as well as logic say that he is right. Ultimately the electric vehicle must supplant all other vehicles, although the process may take longer than Dr. Steinmetz calculates.

The gasoline vehicle cannot be put aside completely for many years. At present it has a number of distinct and peculiar advantages, which it would be folly to dispute. And so long as it keeps itself so effectively in public favor by dint of clever and generous advertising the electric cannot hope to catch up with it, even when batteries and charging facilities have been so improved as to give the gas car no advantage.

But when we consider how much better electric power is than any other form, in simplicity, economy and reliability, and how few obstacles are in the way of its supremacy; when we remember that the present remarkable development of the gas car is due more to the aggressive enterprise and extraordinary activity of its representatives than to any great intrinsic superiority; then we are ready to agree with Dr. Steinmetz that the electric will one day be the only vehicle.

ACTION IMMINENT ON BUS SYSTEM.

Some time ago preliminary hearings were held on the application of the People's five cent bus line for franchises covering the operation of an extensive electric bus service in New York City. During the last few months information was obtained from E. P. Hulse concerning the status of the project at the present time. He stated that on November 13 last, the matter was considered by the Board of Estimate and Apportionment and by that body referred to its franchise committee. Mayor Kline, owing to his limited tenure of office, made no attempt to push the matter, and the franchise committee of the new administration was not announced until early in February and has not been so far officially convened. Mayor Mitchel, chairman of this committee, has given notice that the project is receiving his attention, and non-official expressions of interest in the plan have been obtained from President McAneny of the Board of Aldermen and from Borough President Mathewson of the Bronx, the other two members of the franchise committee. Mr. Hulse believes that the committee has an expert investigating the problem and that his findings will have an important bearing on the decision of the committee and of the Board of Estimate as a whole.

EDUCATE THE USER.

One fault that can be accredited to practically every motor vehicle salesman, and in this the responsibility primarily rests upon the manufacturer of wagons and trucks, is the assumption that a purchaser can utilize a machine to its greatest value. As a matter of fact very few men, especially those who purchase one or several units, can grasp the necessity of using their equipment every minute that is possible, and those who do realize this need are generally handicapped by methods that were used with horses.

Many instances have been noted where the owners of machines failed to obtain anything like the service that was practical, if ordinary thought were given to the work. Most men will gratefully accept advice, but rules cannot be generally applied, and for this reason attention must be given to any particular work and principles adapted. Salesmen cannot be expected to have qualifications that fit them for supervision, but it would be possible for a man with broad knowledge to make suggestions that would be helpful, and to assist in making such changes as would be desirable or necessary to obtain the fullest benefit of the machines.

Impartiality in regard to motor vehicles and horse vehicles was shown in a law recently passed by the city council of Buffalo requiring, among other things, that all vehicles carry lights at night when within the corporate limits of the city. Another bill is before the aldermen, which proposes taxing horse vehicles for registration in the same manner in which motor trucks are taxed.

An Economical Battery Charging Outfit

A New Westinghouse Sectional Switchboard Which Has Arrangements to Keep Records of Energy Used

BY J. C. MC QUISTON

DURING the current year the Curtis Publishing Company, Philadelphia, well-known publishers, built a garage for their electric delivery wagons and trucks, and equipped it throughout in the most modern manner.

One of the most interesting features of the equipment is the battery charging outfit and a striking point of advantage of which is the arrangement made to keep exact records of the energy used by the different cars.

Figure 1 shows the complete outfit. Alternating current is received from the lines of the Philadelphia Electric Company and is transformed into direct-current by a motor-generator set. The generator of this set is so designed that its voltage can be adjusted to approximately that required for the batteries being charged, so that little energy is wasted in the resister.

Figure 2 shows the switchboard, the register being mounted on the rear. It will be noted that this board is sectional. On the right is a large panel which controls the motor generator set. This panel is equipped with a generator circuit-breaker switch, ammeter, voltmeter, field rheostat and (at the bottom) a reverse current relay which opens the circuit-breakers should the direct current voltage fall below the voltage of the batteries being charged. A line voltmeter and circuit breaker for the alternating current circuit are also mounted on this panel.

On the left, are two series of sections which control the charging circuits to the car batteries. Each section controls two circuits and each circuit is assigned to a single car, a small name plate being provided to designate the circuit. It is evident that if more cars are purchased, additional sections can be added to the board as desired. Each circuit is provided with the proper resistance to suit its special car and can be used independently. Hence, any or all of the cars can be charged at the same time.

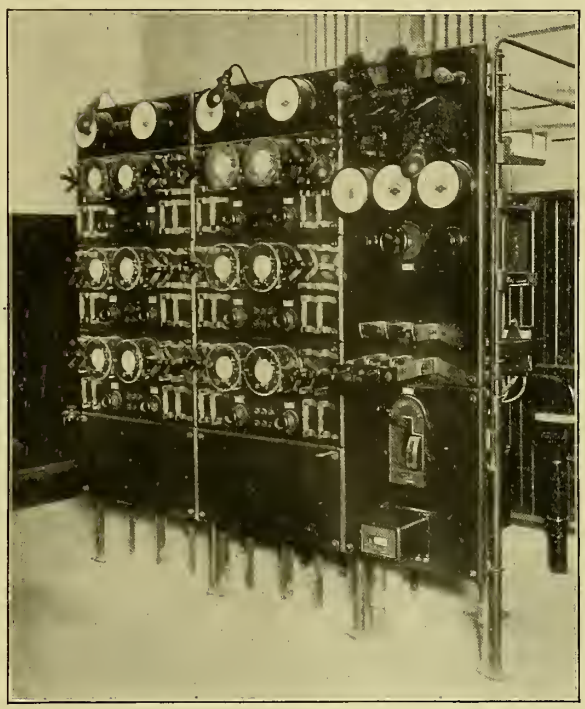


Fig. 1. Westinghouse Charging Outfit Complete. The Generator Can Be Adjusted to Nearly That Needed for the Batteries.

At the top of each vertical row of sections is an ammeter and voltmeter which are so connected with the charging line that the operator at the switchboard can tell precisely the condition of charge of the car batteries on any individual circuit at all times, and does not have to depend on the often damaged car instruments. In fact, aside from connecting and removing the charging plugs, which are connected to lines running into the garage, the operator performs all operations at the switchboard.

Integrating watthour meters are mounted on the charging sections. They have two scales: one, which is set to zero for each charge showing the amount of each separate charge, and the other showing the total amount of energy used by the car from a given date. Thus, an exact record of the current consumed by each car can be obtained for any desired period, and one of the important elements of cost of operation for each car can be exactly determined.

Fuses to protect the battery from overload and a resistance-adjusting rheostat complete the equipment for each circuit.

This outfit, possesses the following advantages: All the charging apparatus is compactly mounted in a very small space. Full protection is afforded to the power and battery circuits, and ac-

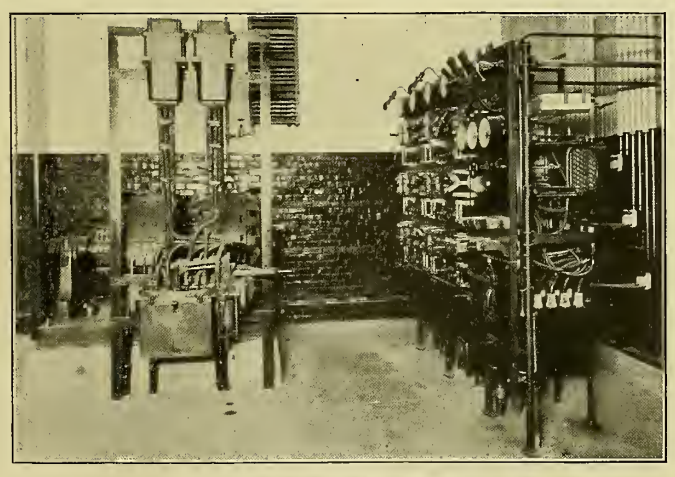


Fig. 2. Westinghouse Sectional Switchboard.

curate meters inform the operator of conditions at all times. Every operation can be performed from the front of the board. Exact information as to the energy consumption of each car for various periods can be obtained. Extensions can be made to the outfit as the fleet of cars increases in size.

The entire equipment was constructed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Massachusetts Institute Research

The activities in electrical engineering research at the Massachusetts Institute of Technology have developed very rapidly during the past year and a noteworthy extension of the organization for administering the researches has recently been effected. This has been aided by the co-operative agreement between Harvard University and the Institute of Technology whereby the departments of electrical engineering in the two institutions were practically merged.

By this new organization for the research laboratory there is created a research committee, to whom reports are made upon the progress of the various researches. The committee comprises the following members of the electrical engineering department staff: First, those who are supervising or actively engaged in research work in the research laboratory; second, those who are personally carrying on research work in any branch of the department; and third, those who have completed a reorganized piece of research work during the preceding year. The research committee, as a whole, will meet once a month during the school term, such meetings being open to all members of the department staff. The chairman of the research committee is also chairman of the executive committee of three members, who will carry on the executive work of the general committee.

It will be noted that by this arrangement the research activities of the department will be brought into close relation with the regular teaching work. Thus, any member of the staff, whether professor, instructor, or assistant, who desires to carry out any original investigation may become identified with the research work through the research committee. Some of the special resources of the research laboratory which have not been designated for use in a particular investigation may be used in providing such a man with apparatus and other laboratory facilities. Even if a member of the department staff is not able to devote a considerable portion of his time to an experimental investigation, he still has the opportunity of offering suggestions upon the conduct of investigations which are being made by others. From the standpoint of the younger members of the staff, the opportunities of entering the enthusiastic atmosphere which accompanies the successful conduct of original research are most unusual.

The staff of the research laboratory at present includes six research associates and assistants who give their whole time to research. This number will be increased to nine on July 1, 1914. In addition to the work of these men, who are appointed by the Institute, the theses of four students who are candidates for advanced degrees in electrical engineering have been carried on in the research laboratory during the past year.

The study of a wide variety of problems has already been undertaken by the laboratory. During the past year, the collection of data upon the study of the relative economic fields for electric, horse, and gasoline trucks, which was begun in 1911, has been completed; an abstract of the results of the investigation has been presented, and the final report will probably be completed early this summer. The study of the methods of handling miscellaneous freight at the Boston freight terminals, begun late in 1912, has been completed, and a paper covering the methods and results of the study has been prepared for presentation at a fall meeting of the New York Railroad Club. An extended study of the effect of the length of passenger ride on street cars upon the net return on the investment in street railway properties is being conducted; it is expected that this study will require about 5 years, during which time the revenues, expenses, and traffic data of the street car systems in a number of the large cities will be analyzed. An analysis is being made of the delivery service of a large department store in New York City, with the object of presenting information upon the factors affecting the operation of the delivery service of such department store; this investigation will be completed during the present summer.

The special research work of the electrical engineering department at the Institute of Technology is now firmly established with a permanent organization which insures the closest cooperation between the lecture, laboratory, and research branches of the department. An amount of over $20,000 is available for salaries, apparatus and other expenses in connection with the work of the research laboratory and library during the next year. The opportunities thus afforded for the department to assume a leading position in the development of new knowledge of electrica engineering and allied industries are both large and unusual.

Goodyear Annouces Price Reduction

The Goodyear Tire and Rubber Company has just anonunced a reduction of approximately 5 per cent in the price of Goodyear individual block motor truck tires.

According to advice received from the factory at Akron, this was made possible by the constantly increasing demand for this type of tire by motor truck operators. Raising the production volume lowered the cost to an extent sufficient to warrant a 5 per cent decrease in selling price, which puts the block tire on the same basis as the endless tire.

In other words, a truck owner can now buy a block tire at the same price he would have to pay for a demountable or pressed-on tire.

This should be welcome news to many truck operators who have heretofore hesitated to equip with block tires because of their higher price, and also to those who have so equipped in spite of the cost.

The immense success that has attended this Goodyear block tire since its introduction on the market, about two years ago, is explained by the fact that it is a block tire that can truly be called "individual." Each block is a unit and is held to the wheel by individual plates and bolts, making it a simple job to remove or replace any block on the wheel without molesting any of the others. A block can be changed in a very few minutes with practically no loss of running time to the truck.

Electric Vehicles in Parcel Post Service

A Paper Read Before the Electric Vehicle Association

BY JAMES H. McGRAW

THE committee of the Electric Vehicle Association on parcel-post application has undertaken a comprehensive campaign of education on electric delivery topics, and in this effort is enlisting the interest and assistance of the post office authorities at Washington, members of Congress, central station executives in all cities having a population of 5,000 or over, of the manufacturers of electric vehicles and accessories, and of the postmasters in cities of 10,000 and over. A very active and comprehensive committee has been appointed by the National Electric Light Association to put before its membership our propaganda and to secure co-operation in carrying out the campaign which we are instituting to engender a sincere and active interest among all parties concerned in the application of electric vehicles for city service in the collection and distribution of parcel post material.

As you have been advised, we have distributed our preliminary pamphlet to the extent of about 5,000 throughout the entire country, and the numerous assurances received in response to this distribution is one of the greatest encouragements we have for the ultimate success of the undertaking. Even in Canada work in this direction is being extended by the Canadian Electrical Association and we have their assurance of whatever co-operation it may be possible for them to render. A similar project to the one we have started has, as a result, been taken up and prosecuted by the Electric Vehicle Committee of the Incorporated Municipal Electrical Association of England.

The principal purpose which we have in mind at the moment is to urge upon every member of the Electric Vehicle Association of America, not only to co-operate in arousing interest on the part of those who may in any way assist in forwarding our purpose, but by bringing to the attention of our committee any suggestions which they believe may be of value to us in the conduct of our work.

Our central station friends can, by keeping in close communication with the postmasters in their respective cities gauge with considerable accuracy what will be their ultimate requirements in electric vehicle equipment when the existing contracts for transportation service shall expire. Thus, it may be possible to prepare in advance either local to each city or at Washington, the necessary means for forcing as far as we possibly can, the employment of electric vehicles under each new contract going into effect.

The number of electric vehicles which could be used, if there were the proper disposition and facilities for employing them, may be estimated from the number of parcels now being handled in fifty of the principal cities. From the figures available at the moment it seems certain that there will be at least 600,000,000 parcels handled annually in these cities. This means 2,000,000 per day. Assuming that an electric vehicle could handle an average of 200 packages per day, it would require 10,000 vehicles in total, or an average of 200 machines in each of these cities.

This is business worth securing for manufacturers, and it would bring to the central stations in each city, an average income of $100 per day, or $1,500,000 in total annually, assuming a power consumption of 12½ kilowatt-hours daily per vehicle.

These figures should not be at all surprising when we consider that the public is buying postage stamps for parcel post service at the rate of about $35,000,000 per annum.

Chicago alone spends $4,000,000, and New York comes next with $3,000,000 annually. Collection and delivery is said to be 90 per cent of the traffic in parcel post transportation, therefore an estimate of 5 per cent of the receipts as the cost of power is not unreasonable.

We are assured by those competent to pass judgment upon our project that we cannot fail in its accomplishment if we continue to persevere in the work necessary to keep it constantly before the interested parties. We may not meet with immediate results as there is an inclination to be cautious in every advance being made by the government to insure the success of the great innovation for which it has assumed responsibility. The attainment of our purpose is equally well worth working for, as aside from the commercial motives prompting our energy in the matter, we have the underlying conviction that nothing can contribute more to the success and economy of parcel past operation than the use of electric vehicles.

We have encouragement for our patience and perseverance in the following quotation from a statement of Postmaster General Burleson:

> The system must be developed. This cannot be done hurriedly. It is our purpose to approach each phase of development not only cautiously but scientifically. We must be reasonably sure that we are right before making each innovation.
>
> For, in a problem so large and so intricate as this, each step forward must be a positive one, without flaws in the way of ambiguity, confusion, or the chance of failure.

This practically indicates to us that we must not expect any rapid, immediate, or revolutionary change from the present systems employed in city transpor-

Interrupting Government Service on Account of Horse Failure.

tation to the use of electric machines, but that we must constantly hammer at the proposition and keep driving our arguments home, so that as each of the present contracts expire electric vehicles will be employed, and do all we can to insure that their performance in each case will be the greatest aid we could have towards increasing their numbers. The campaign really calls more for initial effort at the beginning than any continuance of the same degree of effort subsequently, because the merits of the electric vehicle in itself, as the most economic, convenient and simple means which the government could have in the service, will be brought home so forcibly once a trial is made in each case, that the project will roll along and multiply almost automatically.

We must be eternally vigilant, however, to hold whatever we gain as the result of our collective effort and keep forever before our minds the powerful competitive influence of those advocating other types of motive power in the situation. The horse is pretty well entrenched at present and there will be strong effort to keep him there by those who have investment in that direction and what has become a habit is difficult to alter. There will also be persuasion, prompted by business motives, on the part of those who are interested in having the gasoline machines employed, notwithstanding the evident superiority of the electric in its particular field. In this connection we should bear in mind that the public generally is more inclined to use gasoline machines than electrics, because they are seen everywhere and employed for personal transportation by almost everyone of influence. It seems to be a trait of human nature to be attracted by mechanical movement and there are more "visible" works to the gasoline than the electric.

Let us consider our campaign as barely opened; that we have a good cause; that we are sure to win; that we have very powerful allies on every side pledged to join with us; that the opportunity presented is a splendid one and superior to anything we have ever had before and that we are offering to our government the *means,* in the electric vehicle, and the *conditions,* in the co-operation of the central stations in every city in the Union, to absolutely insure the success of its new and vital undertaking. We thus have a patriotic as well as a business incentive to put our shoulder to the electric vehicle wheel.

A Portable Battery-Charging Set

The Commonwealth Edison Company, of Chicago, Ill., recently tested a small battery-charging rectifier designed to be carried by electric vehicles. The machine was invented by Henry Gandell, and will be manufactured by the Mills Novelty Company, Chicago, Ill. The rectifier, a single-phase synchronous converter, weighs ten pounds and is capable of delivering 70 amperes at 130 volts with a transformation efficiency said to be 99 per cent between the alternating-current and direct-current converter terminals. This device is mounted on a panel 12x20 inches, together with the necessary switches, instruments, and an automatic no-voltage release. The device can hence easily be carried on any electric vehicle and charging can be readily accomplished wherever alternating-current of approximately the correct voltage is available. When used on cars the voltage will be varied during charging by means of a resistance in the alternating-current circuit. This resistance can also be used to reduce an excessive alternating-current voltage. When this rectifier is used in a garage an autotransformer will be employed in place of the resistance.

The rectifier is self-starting, the field excitation being obtained from the direct-current terminals connected to the battery to be charged. This method of obtaining the exciting current, from the battery terminals of the machine, assures the correct direction of the charging current. The machine is so designed that the separation of the segments of the four-part commutator is such that the direct-current circuit is opened at the zero points of the alternating-current wave, thus preventing the flow of a discharging current from the battery during such periods.

The rectifier had previously been given a thorough test by the Commonwealth-Edison Company, the recent test being designed to determine its performance when charging a totally discharged battery. A one-ton capacity electric bus of the Walker Vehicle Company, of Chicago, was selected for the test. It contained a 110-volt battery with a normal discharge rate of 40 amperes. The battery was successfully charged during this test.

Plans to Reduce Motor Truck Abuse

The Motor Truck Club has lately undertaken a new plan for reducing the abuse of motor trucks, especially among its members, by establishing a mutual supervision department through the club office, whereby every member observing a truck being carelessly or recklessly operated can report the fact to the club office, which in turn notifies the owner. The aim is to persuade the driver to maintain greater prudence. If he drives at a reckless speed, or carelessly as to pedestrians, or over obstacles which are likely to damage tires unnecessarily he is likely to hear from it at the hands of his employer.

To further this work, the club has issued several hundred post cards to its members and others desiring to enlist in the volunteer inspection work, to be filled out and sent to the club headquarters whenever one sees any form of truck abuse. This week several cases of driving trucks without suitable tire equipment have been reported, not only to the owner of trucks, but to the tire companies and the truck makers who are interested in guarantee questions, and apparently the service is appreciated.

For the further instruction and improvement of drivers, the club has arranged through its technical committee for a course of five correspondence lectures, for drivers, which is offered to drivers employed by members of the club at a nominal fee. The club is also undertaking to standardize shop practice and repair charges, with a view to keeping certain few garagemen from overcharging truck owners in their charges.

The recent sales of electric trucks by the General Motors Truck Company, of Pontiac, Mich., have included ten cars to the Loose-Wiles Biscuit Company, six trucks to the Merchants' Auto Delivery Company of Galesburg, Ill., and an electric flushing machine to the city of Birmingham, Ala. The latter car consists of a water tank and pressure sprinkler, which has a larger capacity and wider range than the usual form of horse-drawn gravity sprinkling cart.

Touring By Electric Automobile

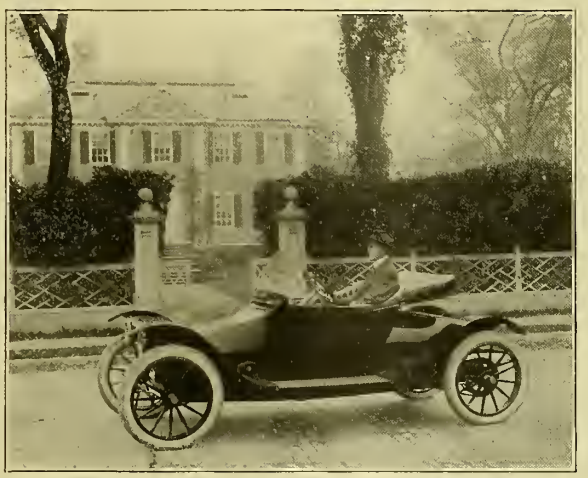
*Urgent Necessity for Charging Facilities in Smaller Outlying Central Stations**

BY J. S. CODMAN

HAS the day of the electric touring car arrived? Or if not, how far distant is it and what must yet be done to hasten its coming?

We cannot yet say that the day has come, but on the other hand it is now close at hand and the obstacles still in the way are neither many nor great.

Already the electric has ceased to be merely a town car. In addition, it is now the ideal runabout both for city and country work. It is more convenient, more dependable, more comfortable and cheaper to operate than a gas car, and within the last few years has been so developed that actual road runs of 70 to 100 miles have been made at a speed considerably greater than the usual road speed of the gas car. To prove this last point a list of various runs made in New England between different points has been published, and probably all New England men who are familiar with one or more of the roads, know about how fast a gas car can comfortably make the distances. All of these runs were made with stock cars and each one was on a single charge of battery.



Model of Bailey Electric Which Made the Runs Recorded.

For touring, the electric has sufficient speed, and two notable tours made within the year, show also that rough, muddy, and hilly roads and bad weather are not real obstacles.

Last summer a tour of between 500 and 600 miles was made in an electric through the Green Mountains of Vermont and the White Mountains of New Hampshire, and no difficulty was experienced either on the steep hills or on the rough or sandy country roads. The distance from Boston to Burlington, Vt. (258 miles), was made at an average running speed of 19 miles per hour. The route taken was through Fitchburg, Ashby, Jeffrey, Dublin, Marlboro, Keene, Walpole, Bellows Falls, Springfield, Walpole, Rutland, Brandon, Middlebury, New Haven, and Vergennes, and motorists who have been over this route will recognize that some parts of it present many difficulties. The slowest run was from Keene, N. H., to Springfield, Vt., 42 miles, 16.7 miles per hour and was made almost entirely after dark. The fastest section covered was from Boston to Fitchburg, 21.3 miles per hour. The 78 miles from Rutland to Burlington (including detours) was made at exactly 20 miles per hour.

An even more notable run was made last October from Boston to Chicago during the most severe weather of the season which turned many of the roads into sloughs of almost impassable mud, but again no greater difficulty was experienced than might be expected with any car under such circumstances.

Some of the data of this trip is given here and especial attention is called to the high daily mileage and high average speed obtained whenever fair conditions of road and weather were encountered.

The car left Boston October 14, arriving in New York the next day, where it was then exhibited for three days at the Electrical Show. It started for Chicago October 19 and ran some part of every day with the exception of Sunday, October 26, when a rest was taken at Cleveland.

The minimum daily mileage was 18 between Albany and Schenectady, following the failure of the garage in Albany to properly charge the car; and the maximum daily mileage was 173.5 between Syracuse and Buffalo, where good roads and good weather were in combination. It will be seen that an average speed of 20 miles per hour was readily attained under fair conditions, while between Springfield and New Haven it was 23.6 and between Rochester and Buffalo, 22.8. The average speed for the whole distance is obtained by dividing the total miles, 1,302.5, by the total hours consumed in running between points, viz., 83.5 hours. This gives an average speed of 15.6 miles per hour, which is certainly remarkable considering that no time at all is taken out for road stops.

The latest remarkable trip in an electric automobile was made in the early part of May, 1914, and for the first time on record an electric automobile left Boston and arrived in New York in less than twenty-four hours.

If then, the electric automobile is not lacking in speed and is fully capable of meeting all road conditions, what is the obstacle to its use for touring? As is evident everywhere, it is the difficulty in getting charged on the road. This difficulty, however, is not to any great extent a difficulty inherent in the car itself. It is true that a battery cannot be filled as quickly as a gasoline tank, but on the other hand, the delay is not great if proper facilities can be obtained. Boosting a battery at high current rates is perfectly practical today. The Edison battery is notable in this respect, and lead batteries, it is now understood, can be charged without injury at much higher rates than was formerly thought possible if only proper care is taken to reduce the rate before the gassing point is reached.

*A Paper Read Before New England Convention E. V. A.

I have myself on one occasion out on the road boosted a battery at 200 amperes for one hour. This battery was composed of Edison A-6 cells rated at 45 amperes normal current, and it absorbed in that hour enough charge to have carried me about 50 miles. On this occasion my cable was passed through the window of the electric light station and connected directly on the exciter bus and very little time was lost in getting connected.

In touring, however, an opportunity such as the above is seldom offered. Usually much time is lost in getting connected and the ampere rate obtainable is usually low. It is this inability to get satisfactory charging service which is the one great obstacle to touring in an electric. Public charging stations are few and far between and when found are as a rule equipped with a hopelessly inadequate 30 or 40 ampere rectifier. On the other hand, if you go to the electric plant itself where there is ample power you will nearly always find those in charge totally unprepared, and you can only be accommodated if someone in authority happens to be on hand; and only then after much time consumed in getting ready. It is not practical to spend an hour getting ready to begin a half-hour's boost.

The overcoming of this great obstacle to touring with an electric is something we must leave largely in the hands of our central station friends. Generally speaking, they are most willing to help when an emergency arises, but this does very little real good. What is needed is apparatus all ready for use and someone about the premises who knows what ought to be done.

Now of course there are central stations which provide ample and convenient charging facilities, but they are very exceptional. In most of the small towns and even in many large cities proper facilities for charging are either non-existent or are very inadequate.

Taking New England for example, Massachusetts is, as compared with the other states, well-equipped with charging facilities and yet what are the figures? McGraw's Central Station Directory reports 114 electric light companies operating in over 300 of the 333 towns and cities in Massachusetts. On the other hand the list of charging stations compiled by the Electric Motor Car Club, after a canvass of all the garages and electric light companies, indicates only 53 towns in which the charging stations are supposed to be located, and only 28 towns where more than 50 amperes can be obtained.

It would certainly seem that where there is in a town no public charging station capable of giving an adequate boost, at least 100 amperes at 125 volts, the electric light company itself should have ready for use a service connected with the exciter bus. This service should consist of a switch, fuses and terminals for connecting to the cable and charging plug which every motorist should himself carry. A cheap resistance coil for controlling the current would also be best to have ready, but often even this is unnecessary especially when the Edison battery is used. Measuring instruments are not necessary, as it is the service rather than the amount of current which should be charged for, and further an approximate measurement can usually be made by means of the instruments on the car itself. Such an outfit would be very inexpensive.

Now in the face of records of this kind, it is time for the central station man to do his part, and if he cannot arrange a neat little installation of battery-charging equipment by using his exciter for this service at a cost which is too small to consider he must be indeed lacking in enterprise. It ought not to be necessary for an electric automobilist to telephone ahead from a point several hours away in order to secure the required charge on arrival. We are inclined to think that most central station men will go out of their way to accommodate the cross country driver of an electric automobile in the particular rare instances when such a machine comes along; but what is really needed is a readiness-to-serve policy which will make the purchase of a charge as simple a matter as the buying of five or ten gallons of gasoline from the village grocery—a continuous availability of the charging apparatus at all hours and at a fair price. With the increase of day service even among the smallest central stations, the time has passed for indifference or sluggishness in the matter of being ready to charge vehicle batteries at 2 a. m. as well as at 6 p. m. through simple home-made flexible connections and resistance whose cost is nominal. Of course, the electric automobiles will not come until the small central station is prepared to charge them; the latter must get into line and be ready for the business, and the ultimate profits are already clear to the farsighted student of electric vehicle development.

RUNS MADE ON ONE CHARGE OF BATTERY.

	Miles	Time	Average Speed
Boston to Pawtucket, R. I. and return (78 miles) remainder of run about Boston	103.2	5:7½	20.14
Boston to Springfield	93.4	4:55	19.00
New Haven to New York	78.4	3:51	20.4
Rochester to Buffalo	77.0	3:45	20.5
Brookline & Groton, Mass., and return.	74.0	4:01	18.4
Springfield, Mass., to New Haven, Ct...	66.1	2:48	23.6
Boston to Wareham, Mass	58.0	2:47	20.8
Worcester, Mass., to Springfield, Mass.	51.7	2:08	24.2
Boston and Fall River	49.9	2:37	19.1
Geneva, N. Y., to Rochester, N. Y.	46.0	2:01	22.8
Brookline & Amesbury, Mass., via Haverhill	45.0	2:12	20.5
Boston & Worcester	42.5	1:46	24.0
Boston to Lowell, Mass	25.9	1:12	21.6
Springfield, Mass., to Hartford, Ct....	27.3	1:3	26.0
Brockton, Mass., to Boston	21.8	1:05	20.2

BOSTON TO NEW YORK IN 24 HOURS.

	Miles	Time running	Miles per hour	Time not Running	Time Boosting	Ampere hours	Ampere hours Per mile
Left Boston.. 4:12 a m							
Arr. Wor'st'r. 5:58 a m	42.5	1:46	24			141	3.32
Left Worc'st'r 8:29 a m				2:31	1:55		
Arr. Spring'd.10:37 a m	51.7	2:8	24.2			150	2.9
Left Springf'd 2:10 p m				3:33	3:10		
Arr. Hartford 3:13 p m	27.3	1:3	26			87	2.3
Left Hartford 4:00 p m				0:47	0:33		
Arr. N. H'v'n 5:47 p m	41.2	1:47	23.1			120	2.91
Left N. H'v'n 9:27 p m				3:40	3:15		
Arr. Stamf'd.11:17 p m	42.0	1:50	22.9			117	2.79
Left Stamf'd. 1:03 a m				1:46	1:30		
Arr. New Y'k 3:21 a m	43.1	2:18	18.9			138	3.2
B'st'n to St'm'd	204.7	8.34	23.9	10:31	8:53	615	3.00
B'st'n to N. Y.	247.8	10:52	22.8	12:17	10:23	753	3.04

Ohio Reports Sales

Reports from the sales department of the Ohio Electric Car Company of Toledo, Ohio, state that there has been a nice increase in the volume of orders received during the past several weeks.

The Greater Electric Vehicle Problems

Paper Read Before the National Electric Light Association Convention

BY HAROLD M. SMITH

DURING the first technical session of the National Electric Light Association convention, held in the ball room of the Bellevue-Stratford Hotel, Philadelphia, Pa., June 2, W. P. Kennedy, representing the Electric Vehicle Association of America, presented a paper on the electric vehicle. Mr. Kennedy's paper was introductory to an address delivered by Dr. Charles P. Steinmetz, which paper appears on other pages of this issue. Mr. Kennedy spoke as follows:

"Competent observers must recognize and acknowledge the gradual dissipation of the difficulties surrounding the introduction of electric vehicles. Most of these have in the past been of a mental rather than of a physical character, and time, with its ameliorating influence, has smoothed away one impediment after another until to-day we have in this device an excellent utility as a means of passenger and merchandise transportation, as well as a formidable implement of commercial activity available to the central station industry.

"The potential possibilities of this power consumer as an integrating factor in the building up of off-peak-period load, while admitted by all, have been aggressively developed by comparatively few and, in fact, are just beginning to attract administrative attention, as worthy of consideration and on a par with the larger elemental influences likely to contribute to future big business extension. In view of the predominant progressiveness of this industry in comparison with others, it is remarkable that so important a projection should remain latent for such a lengthy introductory period, or should be relegated to the minor executive stratum in central station organizations. Particularly so, when other inferior devices have been seized upon and boosted as auxiliary means of stimulating the commercial load factor.

"There can be no denial of the fact that in the past most of the central station companies have assumed little beyond a passive attitude in extending their organization facilities, in the belief that these were simply means to the ends of the manufacturers. Fortunately this has been changed. The distorted perspective is corrected. We now have a true sense of relations and recognize the fact that the manufacturer's product is, in reality, a means to the central station ends. However, it has required persistent and compelling exertion to justify this final conviction, that vehicle load development should be undertaken as the much more substantial and permanent accomplishment of implanting upon the commercial circuits of the supply companies a permanent utility for power consumption its perpetuity.

"Equally conspicuous in the situation is the survival to date of the handful of courageous manufacturers conducting the strenuous campaign enforced upon them, not only in the conversion and education of their present allies, but in defeating the superior competition of the more popular and extensively exploited gasoline vehicle. Some few have succumbed to the severity of the struggle, but in numbers so small as to attest the rugged, determined character constituting the business fibre back of their project. There is no parallel in any kindred undertaking. Their accomplishments have been monumental and, above all, the tests of the past 15 years, which have proved that the electric vehicle can be relied upon as one of the staple commodities among the electric utilities now necessary to our modern system of life.

"The prospective enterprise of *vehicle exploitation on a large scale needs nothing more urgently than administrative effort,* exerted cohesively and comprehensively, to place it upon a plane with the major operations of central station activity and thus give to it the impetus necessary to insure the cumulative return certain to endow its projectors.

"As a business proposition commanding the atten-

Fleet of Walker Electrics in the Service of Case and Martin Pie Company.

tion of the captains of the industry conditions could not be more attractive; the grist is on the threshold and the mill has ample power. Evidence of what has been done and can be done is abundant, convincing and conclusive. The indications put forward by the Electric Vehicle Association of America, in its parcel post project and the solution more recently suggested for the relief of freight terminal congestion, are but straws upon the surface of a torrent almost infinitely deep with opportunity.

"Under the directive influence of that creative talent which has fabricated our stupendous urban electrical utilities, the facilities of such a powerful machine as the collective centers of energy radiating from the central stations throughout the country could yield a force compelling the almost universal employment of the electric motor wagon in city merchandise transportation and the electric carriage as a domestic convenience and comfort.

"We need the superlative administrative genius which has harnessed our natural resources to perform our industrial and community service; that breadth of view which can bridge profit for the brief accelerating period, in anticipation of the fullness of ultimate development; that calibre of judgment which can suppress trivial difficulties and concentrate upon a program of effort against which nothing can prevail. We need the master mind at work."

New Feature of Buffalo Electric

The Buffalo Electric Vehicle Company, Buffalo, N. Y., present a 2,000-lb. chassis and running gear with a new feature consisting of a foot control by means of which the brakes cannot be applied without cutting off the supply of energy to the motor. An extra controller and resistance for operation by the chauffeur's pedal are provided under the front platform, and the manufacturers claim that a saving of from 15 to 20 per cent in energy consumption for a given ton-mileage results, giving correspondingly increased operating distances per battery charge. The advantage to the driver of being able to retain the hold of both hands on the steering wheel on rough roads is important, and the manufacturers emphasize the tendency toward increased energy consumption in equipments in which it is necessary to let go with one hand in order to shut off the power. The machine exhibited had another new feature in the shape of a battery box equipped with a folding lid which can be used as a table in withdrawing the cells, the lid being fastened to the box proper by pull spring hooks instead of the usual troublesome wing nuts. The braking surface total 500 square inches, and the rear tires are 5 inches wide against an average of 4 inches for this size of machine. The motor is supported on trunnions without the use of a universal joint, and the springs are 42 inches long, compared with a common length of 36 inches. The truck is equipped with forty-four cells of Philadelphia WT-15 battery and an 85-volt, 22-ampere General Electric motor.

Electric Moving Van

The Hebard Sheridan Road Storage Warehouse of Chicago claims to have the only electric moving van in that city.

The truck was made by the General Vehicle Company and is equipped with an A-10 Edison storage battery and a General Electric 3.5-hp. motor capable of driving it from 45 miles to 50 miles on a seven-hour to ten-hour charge. The battery consists of sixty cells in five trays and the normal charging rate is 80 amperes at 120 volts. It is charged every night; in fact, the aim is to keep the battery charged at all times. The van is capable of carrying a load of 7,000 lbs. The inside measurements of this "room on wheels" are 6 ft. wide, 7 ft. high and 13.5 ft. long. The tail-gate adds an additional 4 ft. of length when lowered.

In response to a request for information about the actual operation of this interesting electric truck, the Hebard concern reports that it costs about 10 cents a mile for energy to operate the van. It is said to be almost impossible to make a statement as to the actual cost, as road conditions have so much to do with the mileage obtained. Much depends upon the driver. Some men will get a great deal more out the of the battery than others. The hauls of the Hebard electric moving van average about 30 miles and its longest trip was 58 miles. It is the practice of the Hebard people to use their gas cars for hauls in outlying districts or on country roads. The electric van is used on well-paved city streets, not on the soft country roads.

There are so few moving parts on the electric van

G. V. in Storage Warehouse Service.

that its upkeep is reported by its owners as practically nothing compared with that of gas cars. In operation the electric van has several good points. One of these is that the average driver of a gas truck is not apt to stop his engine every time he stops his car, whereas the driver of the electric van has to shut off his energy to stop the car; in other words, with the electric van the expense stops when the cars stop, while with the gas car the engine may be left running, while the van is standing still. At such times the gas engine is running slow, of course, but nevertheless there is some expense, some wear and tear, and, most damaging of all, the vibration is going on all the time.

There are no real "troubles" with electrics when they are properly handled. They are the simplest machines to operate in the automobile field and safe for a child to drive.

Electrics will reduce your operating costs.

Waverley Four-Chair-Brougham Specifications

Improvements in the Latest Models of Electric Passenger Car Construction

By W. W. HUDSON

IN its latest model of four-chair-brougham the Waverley Company, Indianapolis, Ind., has scored an advance upon anything it has previously put out in the field of electric car design; another step in better construction and design.

The car displaces model 107 of its 1914 year book differing from it by such shades of difference as the rounded rear corners, lower battery boxes of improved design, sashless windows, enlarged window spaces, oval corner windows and decorative window shades.

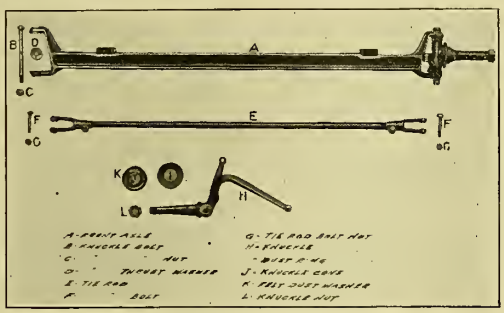
Waverley Fire Quarter Spring Suspension Consisting of Four Full Elliptic Springs.

Developments in these details show a marked improvement in the appearance of the car as a whole. It is the perfect balance and harmony of the various details that produce the effect.

The seating arrangement is unique. The rear seat is divided into three separate drawing room chairs, arranged as they might be grouped in a lady's parlor—the middle one slightly behind the other two—for the sake of increased knee, shoulder and elbow room.

The driver sits in the left-hand rear seat with, instead of apart from her guests, and has complete command of the road, no one being seated directly in front.

At the right-hand of the car an upholstered folding seat accommodates the fourth passenger, who faces the other guests, completing the group.



Front Axle and Parts.

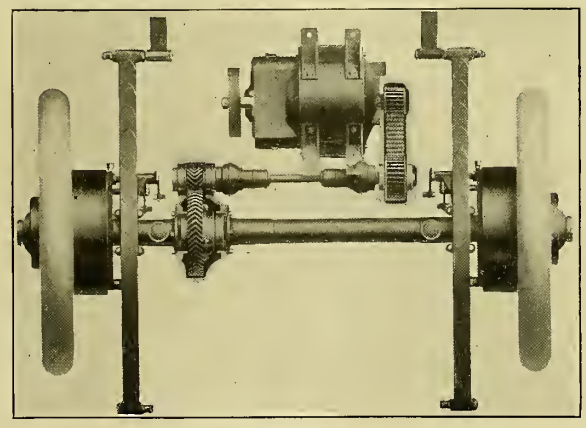
The Waverley frame is a trussed, hardwood beam, giving a cushion for the fastening of all fittings that insures against crystallization and breaking from vibration. By a graceful curve the frame is fashioned to bring the sill entrance low to the ground, and yet leave space between the frame and axle for ample spring action.

The front axle is made of I-beam section one-piece drop-forged steel with integral spring seats, of special steel. The axle is very tough and substantial, giving ample strength horizontally as well as vertically. The rear axle is of full-floating type made from 3½ per cent nickel steel tubing of large diameter, heat-treated. The spindle at the inner end is the full size of the axle tubing.

The driving shaft is a torsional member only, free from bending and twisting strains; is made from special alloy steel, heat-treated and of large diameter. Power is transmitted to the rear hub through a clutch, bolted to the hub at the outer end. The other end floats in the differential. The driving system is a straight line shaft drive. The motor shaft is parallel to the intermediate and driven shafts, thus eliminating the necessity of transmitting power around a corner, and giving the only straight path of power between the motor and the wheels. Two universal joints are used. The axle has absolute freedom in any direction, making the easy riding qualities of these cars. The motor weight is entirely above the springs.

The first reduction is through a silent flexible gear enclosed in a casing at the end of motor. The second reduction is through a herring-bone gear in the axle. The efficiency of this gearing is claimed to be higher than that of any other type. Silence is a striking characteristic of this driving system.

Motor is of medium speed, light weight per unit of power developed and is series wound. The armature rotates on large ball bearings; four poles are used and the design and material employed insure the motor from commutator troubles and rapid deterioration. It has the desirable torque characteristics of a high-speed motor, 1,500 r. p. m., which can not be obtained in any form of low-speed motor.



Waverley Herringbone Gear.

Controller is of the knife blade type and of large capacity. Contact is made on each side of the brass blade by heavy copper blocks riveted to phosphorus-bronze spring fingers. Heating of the blocks will not affect this finger.

For steering, the Waverley non-vibrating lever solves the problem of shocks to the operator on rough streets and has efficient mechanism to eliminate friction.

Taper roller adjustable bearings are used in the wheels both front and rear. They are effectively protected from dirt by dust caps at the outer end and large piano felt washers at the inner end. Gear shaft and motor bearings are all of the non-adjustable annular type, enclosed in oil-tight and dust-proof housings.

The Waverley coach body is suspended on 84 spring leaves giving 33 feet main spring strength of special alloy steel of great strength and toughness.

The five quarter spring suspension used in this type consists of four full elliptic springs, long, wide and flexible, and four quarter springs additional.

Dual brakes of extra large diameter and surface are equipped on each rear wheel. Brake drums are pressed steel and bolted to the hub flange. The hub brakes are of the internal expanding type. The total motor-braking surface is 394 square inches. The hub brakes are provided with an equalizer to distribute the pressure to each rear wheel and are entirely enclosed with a flange protecting the brakes from dirt. In addition to the hub brakes a motor brake of the band-contact type is used.

This model is new chiefly in the body construction and design. It is covered almost entirely with aluminum molding.

Battery is dropped low between the sills allowing of small well-rounded decks.

The side panels of the decks are integral with the body, making a substantial construction. Deck covers are hinged near the body and merely form a cover between the deck panels.

Waverley roofs are made of aluminum, all of one piece, and well padded with felt and canvass to eliminate rumble. Wadding is used under all strainers to eliminate noise.

Frameless glass is used throughout. A great deal of glass is used, the quarter windows being made larger and in addition there are small oval windows in the rear corners.

Back of the two end chairs space is reserved for golf sticks and packages, a convenient receptacle for use on shopping expeditions or trips to the country club.

Owing to its curved sill the Waverley car hangs lower than other electrics, the step and door sill being very close to the ground, while the motor and driving system have greater road clearance than the usual straight sill car affords.

Will Leather Solve the Tire Problem?

A leather tire specially suited to use of motor wagons and trucks has been patented by D. H. Deery of Bridgeport, Conn., which is claimed by the maker to have unusual qualities for endurance. The tires are made to fit any size of standard wheel rim and an average shoe is made of about 600 sections of chrome tanned leather pressed by hydraulic pressure of 5,000 pounds to the square inch, which effectually consolidates it. The tire is retained in its form by a pair of half-inch steel rods that in turn are bolted to the rim.

The inventor claims that his tire is nearly as resilient as a solid rubber shoe and that it will yield about five times the mileage that will rubber. The leather is chemically treated and will resist water, while it is not susseptible to the usual influences that make for the deterioration of rubber. The maker maintains that the tires wil give from 15,000 to 25,000 miles, according to the conditions in which they are worked.

Ohio Electric Climbs Lookout Mountain

A recent climb up Lookout Mountain by an Ohio electric car, with eleven passengers, has created much interest among electrical engineers, principally for the reason that this car is operated by magnetic control—the same method as is used in the cable cars which have carried thousands of people up and down this mountain.

It is claimed that this was the first electric automobile, operated by magnetic control, that was ever driven to Lookout Point.

The winding road leading to the top of Lookout Mountain covers a distance of about three miles, and while it is kept in good condition, it requires considerable power to negotiate the constant upward grades.

The Ohio electric which ascended Lookout Mountain is the same one that climbed Stone Mountain twice,

An Ohio Ready to Climb Lookout Mountain.

and also made a trip overland to Chattanooga from Atlanta—a distance of 167 miles.

The South-Eastern states, with the possible exception of one or two cities, have not previously recognized the possibilities of the electric car to any appreciable extent, but have recently displayed a keener interest in this modern carriage. The three feats accomplished by the Ohio electric recently—climbing Stone Mountain twice, the overland trip from Atlanta to Chattanooga, and ascent of Lookout Mountain—have certainly proven to them the efficiency of the present day electric.

Long distance tours have been made in electric cars frequently during the past few years, which have demonstrated that this method of propulsion for pleasure cars is becoming more efficient and popular every day, as a result of the constant development of storage batteries and electrical equipment and many other refinements.

Controller and Batteries Used on Woods Electrics

Discussion by Chief Engineer R. S. Fend Explaining Advantages of Design and Arrangement

THE monthly meeting of the salesmen for Woods electrics is always an interesting and helpful event in the work of the salesmen and is recognized by them as being one of the greatest aids to efficient work on their part. It has long been the policy of the Woods Motor Vehicle Company to spend considerable time and pains in thoroughly educating its salesmen on the innumerable points, large and small, technical and otherwise. These salesmen's meetings accomplish the desired purpose in a manner which arouses the enthusiasm of the salesman—a vitally essential factor in successful selling.

The discussion is led by R. S. Fend, chief engineer of the Woods Vehicle Company. Mr. Fend has kindly consented to allow ELECTRIC VEHICLES to publish in full the discussion which covers the subject of controller and batteries in their relation to efficiency and general good service on Woods electrics. The discussion follows:

MR. FEND: In designing a controller, like all other parts of a car, the engineer naturally first decides the question as to what the controller must do; what he wants to do with the controller. After he has thus decided he determines which is the best way to accomplish that which it has to do.

I will try to explain to you why we use our method of control, and why we think it is better, and if I am unsuccessful in explaining it, you can draw your own conclusions as to whether it is better. Our controller is simply an arrangement of contacts, controller fingers, for making contacts for connecting up the batteries and the motor in different combinations.

In determining what a controller should do you have to take into consideration, first, that you must regulate the speed of a car from standing still to twenty miles an hour, the maximum speed. Secondly, you must have certain definite speeds at which the car can be operated. And the third point is that you must obtain those speeds by a gradual starting of the car, and with the least loss of power. That is the point, the strong point, about our controller; that we get all of these speeds with the least loss of power, and at the same time the speeds are far enough apart to give a good range of speed and at the same time give gradual starting.

In order to get the different range of speed, it is necessary to study what causes a different speed. That takes you to the motor, because the speed of a motor is determined by a number of different things, just the same as all other functions of the car are determined by different things. One of the things that determines the speed of the motor is the voltage of the batteries. The second point is the strength of the magnetic field. And the third one is in the design of the motor itself. That is, in the number of wires that are on the armature.

We will only consider the first two causes I have mentioned, because they are the only two that are varied; that really can be varied. The number of wires on the armature cannot be varied, because that is determined by the builder of the motor when the motor is made. The only two things that you can vary on the motor are the strength of the field and the amount of voltage that is applied to the motor, therefore those are the two things that you have got to control and change with your controller, and those are the two things that we do change.

Let us take the case of batteries which govern the voltage, and in turn govern the speed of the motor. The speed of the motor is directly proportional to the voltage that is applied to the motor. If we have eighty volts we will have twice the speed that we have from forty volts, etc. Therefore, to change the speed, one way of doing it is just simply to change the voltage, and that is what we do. In changing the voltage to the motor there are two ways in which it can be accomplished; one is by changing the voltage of the battery itself, and the other is by not changing the voltage of the battery, but changing the voltage after it leaves the battery. The first of these two methods is the one we use; the second is the one that a number of other manufacturers adopt, those who use a resistance with the control.

I will explain to you why we think our way is the better. The voltage of a battery is determined by the number of cells that you have, connected in series; the volume or the power of the current that you get out of the battery is determined by the number of batteries that you have connected in parallel. By halving our batteries and connecting the two halves in parallel we halve our voltage, but we double our volume. In the case of the car that has the resistance in the controller, they at all times have their full voltage and their one unit of volume; they do not change the battery connection at all.

The point that I want to make in this discussion is, that all of our batteries are used on any speed of car, and that we commute our batteries or place them in the position in which they are best adapted to give the amount of current that is required on the particular speed at which the car is operated. I will explain that by saying this: When a car is started from a standing start you have a given weight, the car has no momentum, and it naturally requires considerable energy to get the car moving and get it under speed. In order to produce the energy you have got to have the power, you have got to have volume of current. The batteries are connected in series and you have the maximum voltage, the voltage would be too high to give you the slow start that you require, and naturally you have to take some external means of reducing it. In the case of the other cars it is a resistance.

In our case the voltage is also too high, but we take a different means of reducing it. We cut our batteries in two, which in turn gives us forty volts. Forty volts in one half and forty volts in the other half. Now, forty volts are just twice as good for starting as eighty volts are, and when you connect the two halves together in parallel you have it four times as good, because you not only have half the voltage, but you have two times the volume of current, which is just what you need, as I have explained, to get your start; to give you that power when starting.

MR. BURR: But why are forty volts better than eighty volts to start?

MR. FEND: For the reason that I explained earlier, that the speed of a motor is determrined by its voltage. The higher the voltage the higher the speed. What you want when you start is a slow speed.

MR. SANDS: But you require the volume just the same?

MR. FEND: You require the greater horse power, which is represented by the current.

MR. SANDS: Mr. Robinson does not understand fully what you mean by the difference in the wiring.

MR. ROBINSON: Yes, I understand that, but I don't see why you get twice the volume by putting them in parallel instead of series.

MR. FEND: I will explain that. We have a battery of eighty cells. Eighty cells, say, for instance, in our last year's car, had a capacity of twenty-eight amperes. Now, each one of those cells will give you twenty-eight amperes for four hours at two volts. Forty cells will give you twenty-eight amperes for four hours, just the same volume, but forty cells would, if they were connected in series, add up the voltage two volts per cell, and forty times two are eighty volts.

If I divide my battery into halves I have only twenty cells. Each one of those sets have twenty-eight amperes at four hours' capacity, and each one of them has two volts, which gives forty volts. You understand I was speaking of twenty cells. If I connect each one of the other twenty cells with these twenty cells I have two times the volume, or two times twenty-eight amperes, which is fifty-six amperes, for four hours.

MR. ROBINSON: I see, but you have forty volts.

MR. FEND: I have forty volts. Now, you can figure that out. As I stated before, you cannot destroy the power; you are only changing the arrangement of it. If you take fifty-six amperes and multiply by forty volts you will have the same answer as though you take eighty volts and multiply by twenty-eight amperes. In other words, it is just a different arrangement of the power to suit it to the performance and the work that you want to use it for. You cannot imagine a better performance than we have on our controller on the first and second speed, to accomplish that which you want to accomplish. You want a slower speed, and you want a gradual start, and you want more power, and you get it by cutting down the voltage of your battery, which cuts down the speed of your motor. And by connecting your batteries in parallel, which increases

the volume of the current, you get that which you require in order to get your car in motion.

Mr. Burr: That is accomplished by other cars through the resistance.

Mr. Fend: Through the resistance. The point I want to make is right here: I made the statement that we made a gain of four times over what many others gain in using the resistance controller, for this reason. I explained to you that one reason is that we lower the voltage. The second reason is, we connect up our batteries to give us a greater volume of current. And the third reason is that by connecting our batteries to give us a greater volume, the current demand of the car is so light on the battery that the capacity of the battery is not reduced to the same extent as it would be if you were discharging it at a higher rate, that is, in the all series connection of batteries.

I will explain that by saying that we will assume it takes seventy-five amperes to start the car; when you put on your controller in first speed it requires seventy-five amperes to start the car, which is not at all unusual. In the case of the resistance controller that seventy-five amperes is coming out of each and every one of the cells. In the case of our controller that seventy-five amperes is divided among the cells; thirty-seven and a half amperes come from each one of the cells, and twice thirty-seven and a half from the two volumes of cells, from the front and rear cells together, taken as a unit. That is the third gain.

The fourth gain is in the battery itself. That is, with a battery of one hundred ampere hours' capacity, which would mean when discharging at the four-hour rate that it would give twenty-five amperes—four times twenty-five is one hundred ampere hours. If you would discharge that battery at fifty amperes, fifty into one hundred would be two hours, and if the battery was of one hundred ampere hours, at the fifty ampere hour rate it would run two hours, but a battery that is of the twenty-five hour rate, for four hours, will only give you fifty amperes for about an hour and forty minutes. Likewise, that same battery when discharged at a lower rate than twenty-five amperes, say twelve and a half amperes, instead of giving you eight hours, will possibly give you ten hours, or a hundred and twenty-five hours' capacity. In other words, the harder the battery is worked beyond its rate of capacity, the quicker it loses its power; the quicker it gives it off, and the quicker it loses it. In other words, it does not give its rate of capacity unless it is discharged at the rate at which the battery was designed to be discharged.

Mr. Eddy: In starting a car, where the resistance is used in conjunction with the controller, and in starting our own car, the one starting on forty and the other on eighty volts, would the amperage be approximately the same?

Mr. Fend: The amperage would be the same if both cars were of the same efficiency and both the cars started with the same speed.

Mr. Eddy: Yes, that is what I mean.

Mr. Fend: To illustrate your point, suppose we consider the same model of our car, one equipped with a resistance controller, and one equipped with our controller. In order to get the same starting in each case, we would have to add resistance enough in the resistance control to reduce the voltage of the batterry down to forty volts.

Mr. Eddy: Yes, but you would still be drawing eighty volts. You would still be using eighty volts and drawing about the same amperage.

Mr. Fend: The battery would show the same number of volts, but if you were to read the voltage at the motor you would find it was only forty volts. In that case the car would start with the same speed with both controls.

Mr. Eddy: You would be exhausting your battery twice as fast.

Mr. Fend: You would be exhausting your battery more than twice as fast, approximately four times as fast, because you are taking that full seventy-five amperes to start your car, out of each one of the cells, where in the other case you are taking thirty-seven and one-half amperes out of each one of your cells, and the battery will give you a much greater capacity, a battery that is discharged at thirty-seven and one-half amperes instead of seventy-five amperes, which is the case in the battery in series.

Mr. Eddy: The reason it occurred to me was that last winter we had an experience of that kind where both of us were pulling through a snow drift on second speed, all the way into town, and the man who was drawing on series pointed out the fact that he was drawing no more amperage than I was.

Mr. Fend: On series or third speed?

Mr. Eddy: On series.

Mr. Fend: Perhaps he was not, if his car were as efficient as yours.

Mr. Eddy: Yes, but at the same time he was exhausting his battery twice as fast.

Mr. Fend: His battery would not run as far as yours. If his car were as efficient as yours he should be taking the same number of amperes.

Mr. Eddy: Yes, and he was exhausting his battery four times as fast.

Mr. Sands: Mr. Fend, isn't it true that when our ammeter would show thirty, for example, in first and second speeds, that that would not indicate as great a current draft of the batteries as when it was showing thirty amperes in third speed?

Mr. Fend: That is true.

Mr. Sands: It would be approximately the same as giving fifteen amperes on third speed.

Mr. Fend: Yes, just exactly the same, because the amperemeter on the car shows the total number of amperes required to drive the car. Your battery is divided, and each half of your battery is giving you one-half of the current.

Mr. Eddy: That was the case of the car that I was speaking of. We both traveled at practically the same speed, and both drawing practically the same amperage, but they were showing eighty volts and I was showing forty volts.

Mr. Fend: That is the point. Now, if you were operating on third speed and they were also operating on third speed, and both of your batteries were in series, then you would be operating under the same conditions.

Mr. Eddy: Yes, I see that.

Mr. Fend: And if either of you made a greater mileage per charge it would be due to the efficiency of the car and the capacity of the battery.

Mr. Eddy: Yes, I appreciate that. I was speaking merely of where we were in parallel and they were in series on second speed, because that is the speed we were traveling on.

Mr. Fend: We will now take up the change of speed which is due to the motor. We have explained the change of speed which is due to the batteries, and in the case of the motor the change of speed can be accomplished by connecting the fields on the motor to accomplish practically the same result as in the case of a battery. Only, as I explained earlier in the evening, there are two ways which are at our command of changing the speed of the motor: one is by changing the voltage and the other by the strength of the field. The battery arrangement, which is the voltage, as I have explained to you, and the commutation of the field, which is the strength of the field of the motor.

Having received all the benefit of changing the voltage of the batteries, we have to resort to changing the fields, and we do that by connecting the fields in parallel and in series just exactly the same way as we connected the batteries in parallel. The comparison of the two is very similar. You connect your fields just like the batteries, if they are connected in series you have the carrying capacity of one wire, that is, the carrying capacity of the one size of wire with which these fields are wound. And if you connect those fields in parallel, you will be cutting it in half.

There are four fields in the motor, and the center is the armature. There are your four poles. Just as I explained to you in the case of the batteries, in this case, it would go around through this field coil, and go to the next one, and so on until the current has traveled through all of the coils. In that arrangement the fields of the motors are in series, and that arrangement gives you the strongest field, the strongest magnetic field, and the slowest speed. If we connect the fields in parallel we reduce the strength of our magnetic field, but we permit an arrangement of the field which allows more current to flow through the motor, and that current gives you the greater volume of power.

If this arrangement shows the fields in series, I will show you one that shows it in parallels. In this case again we have to do as we did in the case of the batteries, that is, divide it. We divided the battery into two parts; let us divide the fields into two parts. Now, if we divide it evenly we can trace out the flow of the current and show that the current takes two paths. In this case suppose we had fifty amperes flowing. When it comes to a certain point it has two paths. So twenty-five amperes will go each way. They will again unite, so that fifty amperes result again. And this current in turn comes out into the motor and from there out to the negative line of the battery.

First, let me say that the stronger the magnetic field the slower the speed of the motor. The higher the voltage the faster the speed of the motor. I will explain to you why with these fields and series we get a slower speed, if you will just remember that the stronger the field the slower the speed. If the car requires fifty amperes to drive it, that fifty amperes has to

go through every one of the coils. You will notice here that there are twenty-five amperes going through when they are in parallel. Now, I will only have to go through one coil there to show you that there are twenty-five amperes going through there, and the magnetic field is dependent entirely upon the number of amperes that pass through that wire. In other words, I can tell you exactly the strength of the magnet in which I know the number of turns of wire around the magnet, and the number of amperes that are flowing. I multiply the number of turns by the amperes that gives the number of ampere turns, and the given number of ampere turns on the iron core give you the strength of the magnetic field, and that strength of magnetic field diminishes the speed of the motor. Now, in this series position that full fifty amperes have to go through every one of those coils in this way to this point. In this case, when they are in parallel, the fifty amperes divided to twenty-five amperes only go through the coil; twenty-five through that one; twenty-five through the other one. Here they united into fifty amperes again. In each case the motor is doing fifty amperes of work, and as the power of the motor is governed by the number of amperes flowing through it, the power that the motor developed in each case would be exactly the same if the speed were the same. But if the fields were in series the speed would only be one-half as great as though they were in parallel.

MR. SANDS: But the power would be equal?

MR. FEND: No, the power would not be equal. The speed would be half as great.

I know that you are all familiar with the different arrangements of the batteries, and the controller on our cars, but for those who may not understand it I will describe it, and then as you read the report of this meeting you can figure out for yourselves why the different arrangement of speeds takes place.

The first speed commutes the batteries in parallel, which gives us one-half the voltage, forty volts, and two times the volume of current, and on this same speed we have the fields in series, which gives us the strong magnetic field and the slow speed. Now, bear in mind on that point that everything is done to get the slowest possible speed and the greatest possible power. That is what is required.

Second speed. On second speed we want a slight increase in speed, so we will change one of the parts only; therefore, the second speed consists of batteries in parallel, the same as they were on first speed, that is, forty volts, and you put the fields of the motor in parallel, which causes a little higher speed.

Third speed. We put the batteries in series, which increases the voltage to eighty volts, and we put the fields back in the series position, because the difference between forty volts and eighty volts would give us too much of an increase in speed, so we correct that to a certain extent by changing the fields back to series, the same as they were in the first speed.

Fourth speed. We leave the batteries in series as they were on the third speed—eighty volts—and we change the fields to parallel position for an additional increase in speed, which is proportional to the increase in speed that we get from first speed to second speed.

MR. ROBINSON: Then the idea of the relation of the fields to the motor is that of releasing it rather than pushing it; is that the idea? The less current you have in the fields, the more freely the motor spins, is that the idea?

MR. FEND: The less current you have in your fields the greater the speed. That is due to this fact. The number of wires that are laid on an armature in the slots bear a certain relation to the voltage that is applied to the motor, and the strength of the field. If one of them is varied it must be made up by one of the others, because the relation that exists between the voltage, speed and the number of wires always exists regardless of what speed the motor is running at, and if one of the items is changed it must be counteracted by some other item. In order to bear that same relation, if the field is weakened the number of wires remain the same, the voltage remains the same. If the field is weakened the speed has got to increase.

MR. ROBINSON: Then the idea is that the magnetic attraction of the fields either retards or releases the motor according to the amount of power that is in the fields.

MR. FEND: Well, the magnetic attraction is determined again by the number of amperes flowing through these wires. That has no particular bearing on the point that you are making, as I will show you. At this point here the fifty amperes are divided, and twenty-five amperes are going through each part of the fields, but right at the end of the fields the fifty amperes unite again and go through every one of the armature wires.

MR. ROBINSON: Why does the armature spin faster at twenty-five amperes through the fields than it does at fifty amperes through the fields, and fifty amperes still go to the armature?

MR. FEND: Because the fifty amperes are flowing through the armature in each case but in one case each field has twenty-five amperes flowing through and the other case fifty amperes, therefore the field is one-half as strong in one case as in the other.

MR. SAND: Isn't that the thing, Mr. Fend, that you explained the other night about fifth speed? You shoot more into the armature than into the fields, with the result that you get greater speed.

MR. FEND: Yes. As I explained to you, the characteristic of a motor is such that with a weaker field the speed is increased. The characteristic of an armature is such that the greater number of amperes going through the armature the greater the power you get out of it.

MR. ROBINSON: It is something like a governor on a motor?

MR. FEND: The power to drive the car acts as a governor; that is the only governor that comes into action. If you are driving the car at a given speed along the road it requires a given amount of power to drive the car. Now, if you are increasing the current in the armature you are increasing the power of the motor, and consequently having the greater power at the motor it is going to drive the car faster. Does that explain your point?

MR. ROBINSON: The only thing I had reference to is: the less power there is coming through the fields, the more through the armature, the faster the motor spins.

MR. FEND: That is true, but the power that goes through the fields is the same as goes through the armature, only it goes through a different arrangement. In other words, there are fifty amperes going through the field, but they are going through in a different way than they went through, which gives the increase in speed. Twenty-five amperes through two fields and twenty-five amperes going through the other two fields gives fifty amperes, because I have got fifty amperes in each case, but I changed the way in which they go through in order to accomplish the result I want to accomplish, and that is to weaken the field, which gives you an increase in speed. That is one of the characteristics of a motor.

MR. SMITH: You are reversing the current, aren't you?

MR. FEND: No.

MR. SMITH: You are reversing the action when you say, fields in multiple.

MR. FEND: No.

MR. SMITH: You are driving your current both ways?

MR. FEND: No.

MR. SMITH: You are stopping the negative?

MR. FEND: No. Here is a rule that you learn when you first start in elementary electricity at school. If you look at the second hand of your watch, and figure that there is an "S" on the second hand of your watch, you can determine the direction of the current. If the wire is running around the iron core the same as the second hand is going around, and the currents going through that wire in the same direction, then that magnetic pole that is pointing up there will be a south pole. "S," that means south. I learned a different rule. If the wire is coming around this way and the current coming around that way, your thumb will be pointing to the north pole. Now, if what you said was true you will be very apt to have your fields bucking against each other. Now, if we have a case here where the iron core is in here this way (illustrating), and this current coming around that way, this will be a south pole (indicating), and if we turn it that will be a north pole (indicating). These coils are so placed on here that this will be north and this will be south. Regardless of whether this current is divided, or how it is, the coils will be put on in this way, and remember, I just show these wires, for each one of these wires actually goes to the controller, and the controller makes the connection and directs the direction of the current through the field coils.

MR. SMITH: There was perhaps some confusion because of a misunderstanding as to the arrangement of the wires.

MR. BURR: Now will you give us the fifth speed again?

MR. FEND: Yes. As I explained before, we only have the two things at our command to vary the speed of the car, that is by varying the voltage of the battery and varying the strength of the field. I have gone to the limit in changing the voltage of the battery because I cannot get any higher power, which is required to increase the speed. The only thing I can do is to still further weaken the field, and that I do as I explained here. I make a by-path, for half the current to go through two of the coils, and the other half to go through the other two coils. Now, what is there left for

me to do? It is perfectly natural that I have got to afford some other by-path for some of that current. There are fifty amperes here, and I want to afford another path for some of that current to get in the armature to give me the same power that I had, and at the same time not to let all of that current, or such current go through the fields as went through on the fourth speed. Therefore I put high resistance in parallel with the field. Don't construe this resistance to be the same as the resistance that is used in the starting of the car, where the batteries are used in series, because this resistance is in parallel, and used only to by-path a small amount of the current that goes through the fields. I will connect the resistance that is used on the fifth speed, and then trace it out and show you that it is the same thing that is accomplished, namely, that of reducing the current which goes through the field, and therefore increasing in speed.

This resistance, in order to give all the speed that is actually required from fourth to fifth speed, would mean that if there are fifty amperes going through there would, perhaps, be six amperes going through that resistance, but as a matter of easy figuring let us call it ten amperes. On the fourth speed we had twenty-five amperes, and twenty-five amperes going through each pair of fields, which makes fifty amperes, and we only have a total of fifty amperes. Therefore, if this fifth speed was used, and the car required fifty amperes and ten amperes went through the resistance, it stands to reason that only twenty amperes could go through one path and twenty amperes could go through the other path of the field, because twenty amperes in one half of the field and twenty in the other half of the field make forty, and ten amperes more makes fifty.

You can understand that in each one of these positions I have accomplished that which I am trying to do, namely, to get a weaker field, because the strength of the magnetic field is determined by the number of amperes flowing through the coils. In the first case, with the fields in series, there are fifty amperes flowing through each one of the coils. In the fourth speed there are twenty-five amperes flowing through each one of the coils. And in the case of the fifth speed there are twenty amperes flowing through each one of the coils. In each one of these cases a less number of amperes flowed through the coils, consequently the fields were weaker in each case. At the same time they all go back here and unite; the full fifty amperes go in through the armature.

Mr. Sands: But to make that speed, then, your amperage is raised from fifty up to sixty to meet it.

Mr. Fend: Yes. This will answer your question, if you can grasp my meaning. Bear in mind that the current in a battery from the positive terminal is always trying to get over to the negative terminal. I have shown that the current always flowing from positive to negative, the amount of current that flows from the positive to the negative is determined by the path that you afford. It is determined by the opportunity that it has to flow. When a car is standing still and the motor is not running it affords a very great opportunity for that current to flow. Therefore, when you start your car a big amount of current flows. When your car is under speed, the fact that the motor itself is running produces a counter-electro motive force, a counter voltage, which goes against the voltage of the battery, and the only path that is afforded is afforded by the difference between the voltage of the battery and the voltage of the motor. The voltage of the motor is just a little bit lower than the voltage of the battery, and the difference in the two voltages is what forces the two currents through.

In all cases I have considered that the fifty amperes were flowing, and that meant that the car was run at such a speed that only required fifty amperes to flow. That is not a possible thing in practice because as you increase your speed you require more power to overcome the resistance of the road, the wind resistance and the efficiency of your car. I have simply used it in order to explain to the best advantage how the differences in speeds were accomplished. In other words, bear in mind that even though the car did require a greater current, you can see that the proportion, while it would be greater, would be in the same proportion. Consequently you get your proportional speeds.

I just want to say a few words about batteries and the thicknesses of plates that we use. There is a lot of discussion among automobile salesmen as to the size and capacity of a battery that is used in their cars. I want to say to you that it does not make any difference what car it is, or what battery is in that particular car, the capacity of the battery, as long as it is an acid battery, a lead type of battery, is determined by the number of square inches of plate surface that are in that battery, and the life of it is determined by the thickness of each and every one of those plates. Bear in mind that this is on every lead battery, regardless of make. If it were a practical thing, the way to design a battery, or the way to sell a man a car with a battery, if you wanted to sell him the best battery for his particular requirements, would be to find out how many miles he is going to run per charge, how many miles he is going to run per day, if he wants to charge every night, and furnish him a battery with just a sufficient number of plates to give him that capacity which he requires, and then make each and every one of those individual plates as thick as you can in order to get them in the battery, get them in the size jar that is provided with the car. For this reason: if you give him thick plates the plates will stand a greater number of charges. At the same time, if you have a sufficient number of the plates they will have the number of square inches which will give him the amount of capacity that he requires to get the mileage that he demands each time he charges it.

I will explain that. We will say that one of our customers wanted to operate his car in a very level city. He says, "I want to charge my car every night." Well, you have got a jar of a given size. Regardless of what battery you give that man, we are going to fill that jar up with plates and separators the same as this one is filled up, but we would like to divide up those plates and separators so as to give him the best service, so when he is through with the batteries he will have obtained his maximum light and received the best service from his batteries. This man says, "I want to charge my car every night." All right. We will find out how many miles is the maximum number of miles he wants to run per day. He says, "Twenty miles per day." If you wanted to give that man the greatest value in a battery you would give him a battery in which this hard rubber jar will be filled with active material, the same as this one, but in place of having thirteen plates it only ought to have seven plates, or perhaps five plates. Five plates, and each one of them would be two and a half times as thick as in the case of a battery that had thirteen plates; approximately two and one-half times as thick. That battery would give that man his twenty miles every day, and it would last him two and one-half times as long as the battery that you would give him to permit him the greater mileage, and if we put in the greater number of plates.

A manufacturer can only find out the average; he can study the conditions. He can find out the average number of miles that all of his customers want, which is largely determined by competition, by the number of miles that other cars are driven, and the number of miles that other cars will give per charge, and he has got to cut down the thickness of his plates in order to increase the plate surface and give a greater mileage, give a greater capacity, which means a greater mileage. To say that a car has a thirteen-plate battery or a fifteen-plate battery has no bearing on the actual value that a man is getting. It my be a detriment to the man if you are giving him a greater capacity than he has any use for.

That is not saying anything against a thin plate. If all the capacity is taken out of a thin plate battery before it is charged you will get just as many miles to the life of the battery as you will in the thick plate battery, because it is just simply a case of cutting down the number of charges, and getting greater capacity on each charge, or greater number of miles on each charge, and in the other case, cutting down the miles on each charge and getting the greater number of charges.

Mr. Sands: The result in miles during the life of the battery would be practically the same, providing you use up your maximum number of miles per charge?

Mr. Fend: Providing you use up your maximum number of miles per charge.

The thin plate battery has this advantage, that the greater mileage is there if you want to use it. If you should have an opportunity to use the greater number of miles, if you have the thin plate battery, it is there so you can use it. In the case of the thick plate battery the mileage is not there. Twenty miles is your limit in the case I have cited, and then you will have to charge. In the thin plate battery, according to how thin the plates are, and the number of them that are in the battery, you could increase that up to one hundred miles, we will say, and you would get just as much mileage if you took all the mileage out before you put it on charge as you would in the case of the other battery which only gave twenty miles, and had many more charges to its life.

Mr. Robinson: A thin plate battery with intelligent use is a better battery?

Mr. Fend: A better battery for the customer, because he has the mileage of the car, and consequently the usefulness of the electric car is not as limited.

MR. ROBINSON: Won't stand as much abuse?

MR. FEND: Won't stand as much abuse. Now, that is the point that I want you all to get thoroughly fixed in your minds, because later on we are going to have a discussion on guarantees, to show why our guaranty is more liberal than our competitor's guaranty, and unless you get this thoroughly fixed in your mind you will not appreciate wherein our guaranty is better.

MR. SANDS: Mr. Fend, there is a point which comes up there that I think we ought to know about. What mileage do you think our 1501 car will give? What I wondered about was as to how the battery in this car compared with that of the "34," or any of the earlier models.

MR. FEND: This car should give you more mileage when operated under the same conditions.

MR. SANDS: Give you more than the 34?

MR. FEND: Yes. The calculations and the design of the car are such that it will give you more mileage. Sometimes in designing a car there are certain features that do not work out as well as you fignre they ought to; sometimes they work out better, and that determines whether you get more or less. But where we have got a larger car and have more resistance to overcome, we provided more battery to overcome it, and we should get more mileage, and certainly as much mileage.

MR. SANDS: The battery, then, is proportionately greater as compared with the weight of the car and the resistance, eh?

MR. FEND: Yes. In other words, the battery that is in the fifteen hundred car, in place of being discharged when the ampere hour meter reads 140, will be discharged when the ampere hour meter reads 165 or 170. So you see you have got that additional capacity there.

MR. BURR: I had an actual experience with a car on Sunday. I drove out to Evanston against a northwest wind, and if I had continued to go in that direction when the car discharged at 140 amperes, which is thirty amperes less than it will discharge, I would have gotten sixty-two miles.

MR. FEND: Thirty amperes less, you say?

MR. BURR: Thirty amperes, and I would have gotten sixty-two miles going against that northwest wind, and in a very cold day, so I would have gone seventy miles practically under those conditions, which is unusually good. I was very much gratified to find that it would be going so well, and that is actual experience; that is not theory. That is twenty-five per cent more than I figured the car would do. Coming back I was going along twenty-three miles an hour and drawing about thirty-five amperes or thirty-seven amperes, because I had the wind in my back.

MR. SOMMERS: What do you figure the ampere hour capacity of this thirteen-plate battery to be, Mr. Fend?

MR. FEND: The ampere hour capacity is figured on cells alone. With our separation, with the Woods special arrangement on the batteries we get 170 ampere hours' capacity.

MR. SANDS: Mr. Fend, the battery in the 34 is presumed to be discharged at 140, isn't that it?

MR. FEND: A hundred and forty ampere hours' capacity.

MR. SANDS: We have discharged them many times around about 150, and still they have a little capacity.

MR. FEND: Because the capacity of the battery increases with its age; up to the seventy-fifth time that a battery is discharged it will give its maximum capacity.

MR. SANDS: Well, all those things go to show that this Woods special battery gives actually a greater capacity, has greater capacity than a standard battery and the same number of plates, and size of plates, but not so perfectly worked up in the center.

MR. FEND: The batteries will increase in capacity, but the Woods special battery will increase more, because it has a greater capacity for separation.

MR. SANDS: We rate the battery at eleven eighty gravity, because we do not recommend as a regular thing to discharge below eleven eighty.

MR. FEND: Correct.

MR. SOMMERS: On that small battery there at normal discharge rate, twenty-seven amperes for five hours, what would it be on this one here?

MR. FEND: Twenty-eight amperes for five hours. Five times twenty-eight are one hundred and forty.

MR. SOMMERS: What would it be on this one?

MR. FEND: This one would be thirty amperes for five and one-half hours. A hundred and sixty-five, to be exact. That is the catalog rate. Now we get five per cent additional capacity by using the thicker separating in here, and more acid.

MR. SOMMERS: So that we can get five and one-half hours out of that battery at a thirty-ampere rate?

MR. FEND: Yes.

MR. SOMMERS: Now, if it were possible to get fifteen miles at thirty amperes—could that be done?

MR. FEND: No, you get fifteen miles at about thirty-three and one-half amperes. As I explained before, a battery that is designed to give five and one-half hours at thirty amperes, would probably not give you five and one-half at thirty-three and one-half, because the rate of discharge is higher. It would give you about five, we will say. If it runs at five hours, five times fifteen are seventy-five miles. That is figuring seventy-five miles on a battery that is discharged to a hundred and seventy ampere hours. You know that you said you ran our car around to the pin, two hundred ampere hours. You could run it a good deal farther. So that under conditions of this kind, if you were to operate that car at fifteen miles and no faster than fifteen miles, the weather being around seventy degrees Fahrenheit, ideal weather, smooth roads, you take this battery right, and you would have no trouble at all in getting one hundred miles.

MR. SOMMERS: How far would that battery have to be driven to get that?

MR. FEND: As I said, the maximum capacity is obtained between fifty and eighty charges or cycles.

MR. SOMMERS: Between fifty and eighty.

Whereupon the discussion closed.

Goodrich Service Station

The Goodrich tire renewal shops which are established throughout the country are in line with the general tendency throughout the truck industry to reduce lost time to a minimum.

When trucks are idle, production stops, and the various quick loading devices designed for the purpose of saving time reflect the necessity of keeping the truck going all the time.

This problem of getting continuous uninterrupted service out of a truck has received more attention, perhaps, than any other single phase of the truck business, and the policy of the Goodrich concern in establishing service stations, so that trucks need not be laid up for tire changeovers, shows the thoroughness with which the problem is being analyzed.

Before the advent of the service station, a tire replacement meant the loss of much valuable time, because the truck could not work while the tire was being replaced.

Now, with present truck tire service, the passing of a tire means but the loss of a few minutes. Should tires go bad, emergency trucks with skilled tire men go out at once. Calls for such service are made even up to twenty miles radius of the service station.

An instance recently occurred at Newark where the station there was called upon to apply a tire to a crippled truck. From the time the call came in to the time the tire was applied only thirty minutes elapsed, thus saving the owner the profits he would have lost had no such service existed.

The New York station of the B. F. Goodrich is located at corner of Forty-eighth street and Eleventh avenue, a typical example of the chain of stations established. It contains a complete stock of all sizes, so that there need be no delay, also the latest type of wood working machines, hydraulic presses, a complete blacksmith shop, drill presses, heaters, etc.

Central stations should get thoroughly alive to the possibilities for big business that lie in the development of the use of electrics. The charging of electric vehicle batteries offers an off-peak load, and, therefore, is most profitable. It's an attractive and easily handled business, which will bring in a large and steady income.

G. M. C. Predicts Big Sales

"The prospects for a fine motor truck business during the next twelve months are exceptionally bright," says H. C. Yeargain of the General Motors Truck Company.

"For some time previous to the first of the year there appeared to be a marked tendency on the part of some buyers to defer the purchase of industrial equipment until, as they said, conditions became a little more settled. To-day, however, the attitude of business men we call on from time to time seems to be much more optimistic. They evidence a willingness to consider an outlay which promises to effect a saving or earn a profit. In the opinion of many executives the successful passage of the tariff and currency bills has had a big influence in improving the business situation, and one of the first lines to feel the change is the motor truck industry.

"I do not believe there has ever been a time when business men as a whole displayed a livelier interest in the motorizing of the haulage and delivery departments of their business.

"It is not improbable that our recently announced reduction in prices on our various models may have something to do with the unusual number of inquiries we are now receiving. But, at the same time, I feel that his special reason for interest only partially explains the much improved conditions which our men report.

"And when one stops to analyze the situation, there is every reason to expect a big increase in the use of power wagons. Almost everything we eat, wear and use in the course of its journey from the producer to the ultimate consumer must be transported over streets and roads."

Edison Outlines Ford Electric

Emerging for a moment from his laboratories at West Orange, N. J., to talk to newspaper men about his reported Ford "partnership," Thomas Alva Edison deprecated the premature publicity which had been given to the plans. He called attention to the fact that a new automobile, especially one embodying such radical features as a $500 or $750 electric pleasure car naturally must have, cannot be designed and constructed in a few weeks.

"Mr. Henry Ford," he said, "is making plans for the tools, special machinery, factory buildings and equipment for the production of this new electric. I have perfected the motors so that an electric machine can be run much more economically than a gasoline car. The machinery has been simplified, every nonessential part eleminated. It will be simplicity itself, so that it can be run by a child. The cost of the car will probably be between $500 and $750. There is so much special work to be done that no date can be fixed now as to when the new electric can be put on the market. But Mr. Ford is working steadily on the details, and he knows his business, so it will not be long.

"I believe that ultimately the electric motor will be universally used for trucking in all large cities, and that the electric automobile will be the family carriage of the future. All trucking must come to electricity. With an electric truck, double the load and twice the speed can be obtained with half the space. I am convinced that it will not be long before all the trucking in New York city will be electric.

"My experience is that it takes many years to educate people to the adoption of a new thing, even where it is a self-evident proposition. This is another curious psychological phenomenon. For instance, after I had perfected the incandescent lamp it took seven or eight years before it was universally used in New York. So it will be with the family electric and the city truck. Gasoline cars have their field in a territory where great speed and long distance have to be considered, but for city trucking work there is nothing equal to the electric machine, which is more economical in many ways. They are propelled, lighted, heated and cooled by one force, electricity."

Central Station Electric Truck Statistics

The following statistics were prepared by the Philadelphia Electric Company, compiled to show the results obtained from a number of the company's electrics equipped with iron-clad storage batteries manufactured by the Exide Battery Company of Philadelphia.

The period extends up to March 31, 1914, and shows the working ability and long life of this particular type of battery.

The two service wagons of 2,000 pounds capacity each weighs 6,100 pounds unloaded and are of an old type.

While in some instances the average daily mileage is far below the capacity of the vehicles, the batteries were recharged daily in order to be prepared for any extra duty demanded unexpectedly.

Kind of Vehicle	Capacity Vehicle	Size Battery	Battery Started New	Total Miles to 4-1-14	Total Days in Service
Service wagon.....	2,000 lbs.	13 MV I/C	2-15-11	13,511	942
Service wagon.....	2,000 lbs.	13 MV I/C	3-30-11	17,889	888
Delivery wagon.....	1,000 lbs.	11 MV I/C	11-10-11	20,895	774
Delivery wagon.....	1,000 lbs.	11 MV I/C	8-18-11	18,676	884
Tower wagon.....	1,000 lbs.	9 MV I/C	9- 8-11	14,282	802
Completed del. wagon.	1,000 lbs.	11 MV I/C	8-18-11	19,594	742
Completed del. wagon.	1,000 lbs.	11 MV I/C	8-19-11	22,970	879
Compleed del. wagon.	1,000 lbs.	9 MV I/C	8-18-11	17,510	844

Electric Vehicle Association Convention

One of the interesting features of the fifth annual convention of the Electric Vehicle Association, to be held in Philadelphia, Monday, Tuesday, and Wednesday, October 19, 20, and 21, will be a very complete exhibit of electric vehicles, batteries, and accessories, which exhibit will form a special section of the Philadelphia Electrical Show, to be held October 19-24. It is expected that the electric vehicle exhibit will be the most comprehensive, interesting and instructive that the public has ever witnessed, many new developments being shown for the first time on this occasion. Further particulars will be gladly given upon application to the executive secretary, 29 West 39th street, New York City.

Appoints S. A. E. Membership Committee

The following membership committee has been appointed by the governing committee of the Metropolitan section of the Society of Automobile Engineers: Chairman, M. R. Machol; L. G. Busby, John R. Cantey, C. W. Fletcher, Henry Van Riper Sheel, H. W. Slauson, J. E. Schipper, W. J. Sommers, E. R. Waterman, R. B. Whitman, A. M. Wolf and F. C. Wulf. This committee is making a campaign for membership and expects to increase the section considerably during the coming year.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees, and New Announcements

BY A. JACKSON MARSHALL

THE last meeting of the Electric Vehicle Association of America, prior to the summer season, was held in the auditorium of the Consolidated Gas Company, 130 East 15th street, New York City, on Friday evening, June 19, at 8:15, with President Frank W. Smith in the chair.

The meeting was practically given over to a very enjoyable entertainment which will be more specifically reported hereafter.

President Smith, in bringing the meeting to order, called upon the executive secretary to report activities for the month, which are as follows:

Those present were as follows: Messrs. Frank W. Smith, president; Harvey Robinson, secretary; W. G. Bee, W. P. Kennedy, R. L. Lloyd, Charles Blizard, A. Jackson Marshall, executive secretary. And by invitation: J. F. Becker, E. R. Whitney, S. G. Thompson, and F. C. Henderschott.

The minutes of the last meeting of the board of directors, held May 22, were approved as presented.

The executive secretary reported briefly the progress and development in the general office during the past month.

EXECUTIVE SECRETARY'S REPORT.

Pittsburgh Section:—Probably the most interesting development of the month was the formation of the Pittsburgh Section, made possible through the generous support and valuable initiative of Charles A. Ward of the Ward Motor Vehicle Company, who with the executive secretary, traveled to Pittsburgh where a great deal of interest was aroused and the hearty co-operation of the Pittsburgh Electrical League and its members was obtained.

At a meeting of the Pittsburgh Electrical League held on June 11, the Pittsburgh Section was organized and the executive secretary was enabled to return to New York with twenty-two new applications for membership, and a petition for a Pittsburgh section. Inasmuch as the Pittsburgh Section had 5 members it started off with a total of 27 members.

The following officers were elected: Chairman, W. A. Donkin; vice-chairman, T. H. Schoepf; secretary, J. A. Jaques.

The petition, duly made out for a Pittsburgh section, was unanimously accepted by the board of directors. The executive secretary was requested by the board to convey its hearty good wishes to the officers and members of the Pittsburgh Section to thank especially those who were instrumental in its organization.

New England Section:—Inasmuch as we have received no formal report for this section's activities during the past month, we are unable to make any direct reference to the work of the New England Section, although it is understood that matters are progressing very favorably.

Chicago Section:—The executive committee meeting and luncheon was held on May 22, all members being present. Matters of local importance were discussed and action taken.

The regular monthly meeting was held on June 16 at 6 p. m., in the Green Room at Kuntz-Remmler's, the newly elected chairman presiding L. E. Burr who was scheduled as the speaker of the meeting, his address being, "Past, Present, and Future Sales Methods for the Electric Pleasure Vehicle," was unable to attend.

George H. Jones reviewed the recent N. E. L. A. convention, referring especially to the development of the handbook in which was contained a section with reference to electric vehicles, prepared by the operating records committee of the association.

Homer E. Niesz, who was in attendance at the N. E. L. A. convention was next called upon and reviewed W. P. Kennedy's paper which was the prologue to the principal address of the convention, by C. P. Steinmetz.

(This paper appears in full on other pages of this issue.)

C. B. Frayer referred to the efficient manner in which Philadelphia took care of the convention delegates. It was decided to discontinue section meetings during July and August.

The challenge of the Chicago Garage Owners' Association to a game of baseball was accepted and the chairman was authorized to appoint a picnic committee.

Philadelphia Section:—The regular monthly meeting was held on June 10. The speaker was Lieutenant Mills of the Philadelphia police department, the subject being "Traffic Regulation."

We have received no regular report concerning this meeting. Four hundred post card notices of this meeting were printed, as is customary by the executive secretary's office, and addressed to the members of the Philadelphia Section, also to a special list of users, the idea being to gradually work up enthusiasm among the users in Philadelphia, so that same can be converted into an asset at the Philadelphia convention.

R. L. Lloyd, chairman of the Philadelphia Section, was present and gave a brief outline of his section's activities, reporting very satisfactory progress.

Washington Section:—A special meeting of the executive committee was held on May 21, and devoted to arrangements for a sociability run held on May 27. (A full account appears on other pages of this issue.)

Cincinnati Section:—Inasmuch as this office has received no report from the Cincinnati Section, we are unable to communicate anything to the board.

San Francisco Section:—No formal report from this section.

Los Angeles Section:—The Los Angeles Section, authorized at the last directors' meeting, has gotten well under way. The officers of the section are: Chairman, J. Harry Pieper; vice-chairman, Harry W. Harrison; secretary, James F. Rogan.

From the correspondence and otherwise, we believe that we shall have a very successful section in Los Angeles. Regular monthly meetings will probably be instituted at an early date.

COMMITTEES

Membership:—The executive secretary reported progress in the matter of membership and J. F. Becker, chairman, was called upon for the formal report.

The membership committee, through its chairman, reported the receipt of a total of 42 applications for

membership in the association, received since the previous report to the board of directors. These applications are divided into the several classes of membership and make a total number of members at this time 763. The standing of the membership in the section is augmented by the formation of the Pittsburgh Section since the last report.

The copies of the printed list of directors, officers, committees and members for the year 1913-14 have been forwarded to the members with a letter, copy of which is attached, urgently asking each member to secure at least one new member to "double the membership."

The announcements of the June entertainment meeting of the association, with a reprint of Dr. Steinmetz's prophecy for the electric vehicle, are being given wide circulation and distribution to each of the central stations and other prospects upon our mailing list, numbering over 1,200.

MEMBERSHIP, JUNE 19, 1914.

	Active. C. S.	Active. Mfrs.	Associate.	Auxiliary.	Press.	Total.
May Report	93	35	560	10	28	726
Resignations	1	3	3			7
Total	92	32	557	10	28	719
Transfer			1		1	2
Total	92	32	558	10	29	721
Applications	4		38			42
Pending	96	32	596	10	29	763
Total Members	128		596	10	29	763
CHICAGO SECTION.						
May Report	12		96	1	6	115
Resignations						
Total	12		96	1	6	115
Transfer			1			1
Total	12		95	1	6	114
Applications			2			2
Pending	12		97	1	6	116
NEW ENGLAND SECTION.						
May Report	32		76	1	1	110
Applications						
Pending	32		76	1	1	110
Total Members	32		76	1	1	110
PHILADELPHIA SECTION.						
May Report	4		51	1	1	57
Resignations			1			1
Total	4		51	1	1	56
Transfer			1			1
Total	4		51	1	1	57
Applications			2			2
Pending	4		53	1	1	59
Total Members	4		53	1	1	59
WASHINGTON SECTION.						
May Report	2		33			35
Applications						
Pending	2		33			35
Total Members	2		33			35
SAN FRANCISCO SECTION.						
May Report			15			15
Resignations			1			1
Total			14			14
Transfer					1	1
Total			14		1	15
Applications			2			2
Pending			16		1	17
Total Members			16		1	17
LOS ANGELES SECTION.						
May Report		1	23			24
Applications		1	5			6
Pending		2	28			30
Total Members		2	28			30
PITTSBURGH SECTION.						
May Report		1	4			5
Applications		1	21			22
Pending		2	25			27
Total Members		2	25			27

Educational Courses:—Prior to the director's meeting a very important meeting of the educational courses committee was held in the offices of President Smith, when tentative plans were formulated for the development of educational courses. This matter is now well in hand, and hope to be able to report progress at the next board meeting. The following resolutions were adopted:

To accept draft submitted by the Armour Institute, through its Dean, Professor Raymond, or modifications of that draft, as suggested by members of the educational courses committee, as a basis of a course which the association would ask certain educational institutions, especially in cities where the association has sections, to incorporate same as part of their curriculums.

That the committee proceed to draft a course more suitable for the electric vehicle salesman, with a view of having this course, when finally perfected, incorporated as part of a course for central stations and manufacturers, and others who might be interested.

Garage and Rates:—Since last directors' meeting, John F. Gilchrist has accepted the chairmanship of the garage and rates committee. A special meeting of this committee was called to meet at the Hotel Pontchartrain, Monday, June 29, which the executive secretary attended upon request from Mr. Gilchrist.

George B. Foster, active for Mr. Gilchrist in the work of this committee, has been extremely busy, and it is felt that the garage and rates committee will have a very interesting report for the Philadelphia convention.

The executive secretary has been making an investigation of conditions on Long Island and endeavoring to provide charging facilities at a few points. This investigation will show that there are a few garages that could be induced to take up the charging of electric vehicles provided that we are assisted in the installation cost. A letter has accordingly been addressed to the manufacturers of charging equipment stating that the most effective way in which their companies could help sales would be to extend a certain amount of credit to a few financially sound garages so that necessary charging apparatus might be obtained on the deferred payment plan. We have had very satisfactory replies from the Cutler-Hammer Manufacturing Company, Wagner Electric Company, and Electric Products Company concerning this development. Mr. Gilchrist will, no doubt, follow up this development and report progress at our next convention. This development will be extended over the country as conditions warrant.

It is interesting to note in connection with our official garage signs the increase in the demand for these since our publicity work has been started and the official garage folder distributed generously.

In 12 months, 4 garages were supplied. Since some active development work has been carried on, 12 signs have been placed in the last two months, 8 of these in Philadelphia, 2 in Buffalo, and 2 in Saginaw, Mich.

Papers:—Chairman Thompson has submitted a complete tentative program of papers for the convention and it is our understanding that the manuscripts will be sent to the general office at least six weeks in advance of the

convention so that the papers may be printed and available practically one month in advance of the convention, thereby promoting the study and materially facilitating discussion and economizing the time necessary for presentation.

Mr. Thompson indicated the program as so far developed, the completed form of which will be published from time to time.

Standardization:—E. R. Whitney referred to the work of his committee and reported progress. Mr. Whitney also spoke of the desire of the Society of Automobile Engineers to have their committees treat with the standards of electric vehicle parts and practice with the electric vehicle design and equipment, and offered the following resolution:

That as the recommended practice advocated by the standardization committee of the Electric Vehicle Association of America has been adopted by the American Institute of Electrical Engineers, the Electrical Vehicle Committee of the Incorporated Municipal Electrical Association of Ipswich, England, the National Electric Light Association, and other interested organizations, and as the Society of Automobile Engineers, now appreciating the position which the electric vehicle is designed to occupy in motor transportation, and is therefore desirous of having the electric vehicle receive due consideration from its committees, the Electric Vehicle Association of America, upon request of the Society of Automobile Engineers, has requested that the chairman of its standardization committee acquaint the chairman of the Society of Automobile Engineers' standardization with decisions and deliberations of the Electric Vehicle Association committee to date; the Society of Automobile Engineers' committee to be so constituted and operated as to give adequate consideration to electric vehicle matters, it being understood that the Electric Vehicle Association's standardization committee is to remain active insofar as it can be of assistance in supplementing the efforts of the Society of Automobile Engineers' standardization committee, and also for the purpose of acting upon matters of peculiar significance to the electric vehicle industry.

The motion being regularly approved, the executive secretary was authorized to bring same to the attention of the secretary of the Society of Automobile Engineers.

Philadelphia Convention:—The convention committees are complete with the exception of the chairman for the general convention and finance committees. It is expected that these two committees will be complete in the next several days. Matters are progressing nicely, and we have every reason to expect a very successful convention.

Conditions Abroad:—We have received two or three reports from the Electric Vehicle Committee in England showing a well-defined course of action in connection with the activities in the electric vehicle industry. We have also been in communication with J. A. Wilkie of Manchester, England, who has inquired concerning the use of batteries in foreign countries of high temperature such as Bombay, India. We have referred this request to our battery manufacturers and have extended to Mr. Wilkie the co-operation of this office. Mr. Wilkie has been in communication with Mr. Ayton of the Electric Vehicle committee, both of whom are in favor of becoming a branch of this association.

Mr. Neely of the Electric Storage Battery Company also informs us that their representative in England, Mr. Thompson, is greatly interested in the sectional development and we have been requested to get in touch with him and forward all literature on the subject.

Prospects:—It may be interesting to note that since the last meeting of the board of directors we have received 21 inquiries of which 14 were "common" and 7 "preferred." The total number of inquiries received to date is 196 passenger and 131 commercial.

Publicity Work:—We are compiling in the executive secretary's office a large mailing list to whom press notices are sent at regular intervals. This list includes trade journals, newspapers, house organs of central stations and a special list of those interested in our publicity matter.

Through the courtesy of Harvey Robinson, photos and an announcement of the New York Electric Vehicle Association exhibit were forwarded to this office which were in turn sent to about 75 trade journals and newspapers.

A press notice concerning the development of sections and the rapid growth in membership, also including a short notice with reference to convention headquarters was sent out on May 25. On May 29, a sixteen-page report of the May 22 meeting and the principal points of interest and development work taken up by this association during the month of May was issued. In connection with W. P. Kennedy's address on the electric vehicle before the New York Electrical Society, on June 10, press notices were sent out to all New York newspapers and trade journals.

We have also released for publication an article by J. S. Codman entitled "Touring by Electric Automobile." (This article appears in full in this issue.)

We are working with the editorial staffs of the *Municipal Journal* and *Dry Goods Economist* in the matter of collecting data and preparing elaborate special editions showing the performance of electric vehicles in municipal and department store service, the idea being that instead of these and other papers printing from time to time disconnected articles sometimes of questionable value, they make an effort to collect performance data, which may be expressed in an interesting and instructive manner, same being included in a special insert to be printed on a tinted paper, the insert to carry any advertisements which the manufacturers may desire to give publicity.

Gas Car Data:—A letter has been sent to all the section secretaries asking for performance data of gas cars relative to their average daily mileage and average speed, it being our desire to indicate that the electric vehicle is applicable to large percentage of work now performed by gasoline cars, as it is thought that the rates of speed of the electric vehicle is in most instances more than sufficient to meet average gas car demands.

Mr. Thompson proposed and Mr. Blizard seconded the motion that a vote of thanks was due the Edison Storage Battery Company for the motion picture films made possible through its generosity, and which have proven of such considerable value to arousing further interest in the electric vehicle. This motion was unanimously carried.

TREASURER'S REPORT.

Balance, June 1, 1914	$4,381.82
Received from June 1 to June 18	142.33
Total	$4,524.15
Bills paid from June 1 to June 18	564.96
Balance June 18, 1914	$3,959.19

The meeting adjourned at 4:30 p. m.

Waverley Trucks for Pittsburgh

Five Waverley 2-ton electric trucks were shipped recently to the Duquesne Light Company, Pittsburgh, Pa. The slogan "You can do it better with electricity" is printed on the battery boxes of these trucks and effectively and forcibly calls the attention of the public to the advantages of electricity.

C. T. Truck Makes Record Run

A Commercial Truck Company's 5-ton electric truck identically similar to the accompanying photograph recently accomplished a feat which shows the enormous ability of this type vehicle.

On May 18 this truck, one of the heavy units used in the service of the Curtis Publishing Company, Philadelphia, left Philadelphia under its own power, the intention being to demonstrate in New Haven, Hartford, Springfield and Fall River.

The truck has made satisfactory demonstrations at the points mentioned and is now demonstrating in Fall River. The following schedule shows the time the car left Philadelphia and the time of its arrival and departure at the different cities; also the miles covered, the running time, and the ampere hours used, as well as the ampere hours per mile.

This vehicle was equipped with 42 cells, 21 plate MV Ironclad Exide battery which is considered standard equipment.

	Date	Miles	Time	A.H.	A.H. per Mile	
Left Philadelphia	5/18/14					
Arrived Trenton	5/18/14	33	4:30	235	7.1	
Left Trenton	5/18/14					
Arrived Perth Amboy	5/18/14	40	5:10	270	6.75	
Left Perth Amboy...	5/19/14					
Arrived New York...	5/19/14	20	2:50	130	6.5	
Left New York.....	5/20/14					
Arrived Stamford ...	5/20/14	39	4:30	320	8.2	
Left Stamford	5/20/14					Boost ½ hour at
Arrived New Haven.	5/20/14	46	5:30	357	7.8	Bridgeport
Left New Haven....	5/24/14					
Arrived Hartford	5/24/14	39	4:35	304	7.8	Hilly
Left Hartford	5/26/14					
Arrived Springfield ..	5/26/14	27	3:00	185	6.9	
Left Springfield	5/29/14					Boost at Spencer
Arrived Worcester ..	5/29/14	55	6:45	522	9.5	Long, steep hills
Left Worcester	5/30/14					Boost at Paw-
Arrived Fall River...	5/30/14	64	6:46	495	7.7	tucket
		363	44:36	2,818	7.6	

Electric Vehicle Operating Costs

The twenty-six trucks in the service of the Kansas City *Star* are divided equally between electrics and gasoline models. Of these the electrics all have been purchased within the last year. But in that time they have successfully met all conditions of service and have proved entirely satisfactory in every manner.

While individual charts showing the expenses and repairs incident to each car have not been kept, the *Star* figures the depreciation of its electric trucks at about 10 per cent a year. The gasoline trucks, with the exception of the heavy Panhard, have been given a depreciation rating of 25 per cent a year. The big Panhard, however, has proven its depreciation at less than 16 per cent a year, but on the *Star's* books it is figured at 20 per cent.

The cost of operating the trucks is comparatively small. The G. M. C. electrics require about 15 kilowatts of electricity for a full day's trucking of 12 hours. The *Star* maintains its own electric power plant, and the batteries are charged without appreciable increase in the cost of operating the power station. However, the truck department is charged 3 cents a kilowatt for the power used. At this rate the 1-ton trucks are operated at an expense of 45 cents a day for power. The heavier 2-ton Baker consumes 22 kilowatts for a full day's use and is operated at an expense of 66 cents a day.

Electric Vehicle Developments in England

At the last meeting of the electric vehicle committee of England, held in Birmingham, sample charging plugs fitted with earth connection contracts were inspected, and a particular design was selected for standardization, says the *London Electrical Review;* consideration was given the method of gripping the flexible cable to the plug and the connecting of the earth wire to the plug shell. It was decided to recommend that the plug receptacle on the vehicle should be fixed under the driver's seat, preferably with the plug pointing upwards so as to make it impossible for the driver to take his seat without noticing that the charging connection was attached to the vehicle. Cases were mentioned where serious damage had been caused by a driver starting his vehicle away without disconnecting the charging plug—the connection for the latter being placed at the rear or at the side of the vehicle. It was also decided to recommend that the fixed receptacle in the garage, for taking the charging connections, should be placed in an accessible position, preferably horizontal; and that the center contact of the plug should always be the negative—the arrangement adopted by the Electric Vehicle Association of America.

A communication was read from the secretary stating that the Accumulator Manufacturers' Section of the association had decided to recommend for standardization a plate for electric vehicle batteries having dimensions of 8⅝ inches by 5¾ inches, with lug centers 4⅜ inches; the accumulator manufacturers had under consideration standardization in the sizes of the cells.

Further progress was made in in the matter of arrangements for publicity and for garage and charging-station signs.

Electrics for New Fish Pier

During this past week there have been a number of notable additions to the motor truck fleet of New England. Among those creating the most interest are the first three of a fleet of great General Vehicle electric trucks, for use on the new fish pier at South Boston. These machines are of 5-ton capacity and are provided with electrically driven dumping bodies. The machines are designed for carrying cracked ice from the great ice plant at the head of the pier to the fishing boats that are moored beside the pier. The trucks run down the wharf and turn so that the back of the bodies overhangs the wharf and side of vessels. An electric switch is thrown and in one minute the great body is raised and the ice slides out and down into the hold of the vessel. A reversal of the switch lowers the body and with the least possible effort on the part of the operator the five tons of ice have been delivered and the machine is returned to the ice plant for another load. Six of these great automatic G. V. electrics will take the place of eighteen to twenty of the ordinary form of lumbering ice carts.

These electric trucks are charged with electric current, at the electric station on the pier. On account of the incompleted appliances for handling coal the new electrics are meeing the emergency by hauling great loads of coal. The automatic electric dumping bodies make an exceptionally rapid way of handling the coal

Another truck installed this past week is a great machine for the delivery of sugar by the American Sugar Refining Company. This machine has the largest body of any truck in Boston and is capable of carrying five to seven tons of sugar.

New Bedford is to have a number of additions to its motor truck fleet. The principal companies adopting the motor vehicle are the New Bedford Gas & Edison Light Company, the Pairpoint Corporation and the J. V. Spare Dry Goods Company. The lighting company is already operating 10 electric business wagons; the Pairpoint Corporation is adopting the 3½-ton G. V. electric heavy duty trucks, while the J. V. Spare Company is putting on some natty electric wagons of the light type, especially designed for department store delivery.

Analyzing Chicago's Traffic Problem

It is quite true that Chicago city authorities are, in a measure, responsible for traffic congestion, that grows worse year by year.

It is further true that the only adequate relief from such congestion, in the downtown streets, will come from the exercise of the city's "regulative" powers over all forms of vehicular traffic, including street cars and automobiles.

For instance, it is evident that certain fundamental propositions underlie the traffic problem in Chicago's streets, as a whole, namely:

There must be provided a downtown parking space for automobiles, preferably under Grant Park, in order that street curbings may not be used as temporary storage for motor cars.

The city must adopt and enforce peremptory regulations for keeping truck traffic off the street car tracks, as far as possible.

The street crossing regulations must be modernized, so that pedestrians and vehicles will cross simultaneously, in alternate streams, and under rigid police regulation.

The first point to be observed, in common sense dealing with the traffic problem, is that the municipality's police power must be in constant exercise—that all kinds of vehicles and pedestrians must obey certain rules, and that the same rules will apply to street car companies that have certain contract rights in streets as public cariers.

In other words, there can be no distinction made between a vehicle operating under a contract franchise, and a vehicle owned by a private individual or firm, when it comes to enforcing the "rule of the street" for the public's good.

It must be admitted that the increase in traffic congestion, due to automobiles, within the last few years, is a serious phase of the problem—one that can be met only by a central parking place that will take these motor cars off the streets when not in actual use.

The South Park commissioners, who control the only available location for such a parking space, have a joint responsibility in the matter.

The city authorities have made plans for an adequate storage space underneath Grant Park, subject to the consent of the commissioners.

Official co-operation thus becomes necessary.

The city must do its own share in reducing traffic congestion, while it exercises its "regulative" power over public carriers to the same end.

Electric Vehicles at Boston

The Electric Motor Club of Boston on April 8 discussed plans for holding a tent exhibition of electric passenger cars and trucks in various New England cities, and the co-operation of several central stations was manifested in regard to the securing of sites and supplying of garaging facilities. It is planned to exhibit as many of the seventeen representative makes having agencies in New England as can be induced to join in the enterprise, the Boston Edison Company providing the tent. In addition to cars and trucks there will be an exhibit of rectifiers, batteries, tires and other equipment of direct interest to the electric-vehicle owner.

C. H. Miles, Boston, stated that quotations have been received from one of the foremost map-publishing houses in New England for printing a map showing the location of charging stations and the automobile routes in this section of the country. The concern is ready to supply 5,000 copies at 10 cents each or 10,000 copies for about 7 cents each. R. S. Hale, of the Boston Edison Company, called attention to the adoption in England of the 150-amp charging plug recently standardized by the Electric Vehicle Association of America and exhibited samples of cab-tire sheathing for charging cables, emphasizing the demonstrated value of this material abroad as a tough, acid-proof and alkali-proof wire covering, and urging its production by American manufacturers. Other matters briefly discussed were plans for the annual outing of the club and for an electric-vehicle convention to be held in Boston about the middle of May.

Electrics in Providence

Twenty-nine electric pleasure vehicles are in service in Providence, a gain of 31 per cent over 1912, and there are now eighteen electric trucks in operation. The company's income from charging has increased about 300 per cent. The electric-vehicle situation was never brighter in the city, and great care is exercised in the selection and recommendation of such equipment. In the past the idea was widely held that electric vehicles were unadapted to service in a hilly city like Providence, but this point of view has undergone a change. At the Shepard Company's department store a Detroit electric delivery wagon makes four trips and delivers an average of 300 packages daily over a route on which horses formerly used could make only three trips. Four times a day this vehicle climbs a grade of about 18 per cent maximum, and it makes a run of about 40 miles every day. The entire cost of operation is only slightly more than the former horse cost, and about 33½ per cent more work is done by the electric vehicle. The cost per ton of transporting freight to the store from the freight houses and docks is considerably less than when horses were used.

Three-Wheel Electric Delivery Wagons

Stern Brothers' department store, New York, has introduced a three-wheeled electric which is proving to be exceedingly successful in making deliveries to hotels. The vehicles are well adapted for making quick deliveries especially in congested districts and the owners state that for delivery of light materials this new contrivance is very favorable.

The delivery wagons are capable of carrying 500 lb. for a distance of 35 miles at a speed of 12 miles per hour. The battery is installed under the seat, and the motor is mounted in a vertical position over the front wheel, which exerts the entire tractive effort. The vehicles were manufactured by the Berliner Electrik Fabrik.

Stern Brothers at present keep the vehicles in a public garage until their own garage is completed.

Electric Touring Book

"Electric Touring" is the title of a very valuable book for users of electric vehicles in the vicinity of New York City and vicinity. The book is issued by the New York Electric Vehicle Association and indicates resorts and routes within touring capacity of the electric. The routes are described in detail, an accompanying map showing the location of the charging stations and garages. The books are distributed through manufacturers and agents of electric vehicle and accessory manufacturers free of charge.

PERSONAL AND BUSINESS NOTES.

Z. C. Elkin has succeeded E. J. Kilbourne as manager of the Chicago branch of the General Motors Truck Company. Mr. Kilbourne has accepted a position as territorial manager for the Oakland Automobile Company.

E. Witherby formerly Chicago representative of the General Vehicle Company has accepted a position as New England representative of the Gas Machinery Company, of Cleveland, Ohio. Mr. Witherby has long been a prominent factor in electric vehicle developments and has been considered as a foremost promoter of this type vehicle in the middle West.

W. A. Zimmerman, formerly with the Mercury Manufacturing Co., of Chicago, has been appointed director of sales and publicity of the Buffalo Electric Vehicle Company.

Frank C. Brown, formerly district sales manager for the Chase Motor Car Company is now truck sales manager of the Buffalo Electric Company.

Irving W. Daw, formerly with the Rauch & Lang Electric Car Company has been given charge of the pleasure car division for Buffalo electrics.

L. Wagner, formerly of the Baker Electric Motor Company of Cleveland, Ohio has accepted a position as traveling representative for the Century Electric, Detroit, Mich.

Ernest Lunn, formerly president of the Walker Vehicle Company, Chicago, has resigned to take the position of consulting engineer for the Pullman Company. Mr. Freeman will succeed as general manager.

G. H. Eddy has been appointed city sales manager of the Woods Electric, Chicago. Mr. Eddy succeeds R. M. Sands, resigned.

C. E. Murray, who has formerly been coast manager for the Willard Storage Battery Company, recently passed through Seattle en route to the factory at Cleveland, and from there he will take charge of the European business of his company. F. D. Tobin succeeds Mr. Murray as coast manager.

O. B. Henderson, sales manager of the passenger car department of the Baker Company, has resigned and will take up his permanent residence in Los Angeles.

The Ohio agent in Kansas City is now operating under the name of Ohio Electric Kansas City Company and is now located at Thirty-third and Main streets.

The following agencies have been established to distribute Ohio electrics: Cherokee Motor Co., Bartlesville, Okla.; Drennen Co., department stores, auto department, Birmingham, Ala.; Walter B. Wight, 17 East Seventeenth street, Chattanooga, Tenn.; Elizabeth Auto Co., 14 Westfield avenue, Elizabeth, N. J.; Winslow Auto Co., 1109 Garrison avenue, Fort Smith, Ark.; Law Auto Co., Elks Building, La Crosse, Wis.; Adams Machinery & Manufacturing Co., Mobile, Ala.; The Schee Co., Oskaloosa, Iowa; H. F. Kircher, Peoria, Ill.

Willard Storage Battery Co., Cleveland, Ohio, has changed the location of its Indianapolis branch which has been maintained during the past year at 438 and 439 Indiana Pythian Building, to more commodious quarters at 318 North Illinois avenue. A complete stock of batteries and repair parts will constantly be carried on hand at the new branch. Up-to-date charging and repair facilities have been installed and placed in charge of competent factory-trained storage battery men. The new branch will remain under the management of S. S. Jenkins.

Storage Battery Sales Increase

The business of the Willard Storage Battery Company, Cleveland, Ohio, it is reported, has been quadrupled in the past four years. F. S. Gassaway, district manager in New York, states that this increase is due in good part to the continual efforts of the company to give reliable service. Service stations are maintained in all the important cities of the United States and in many foreign cities. Considerable attention is given to the education of its customers regarding the proper usage of storage batteries. Booklets are printed in English, German, French and Spanish with full directions for taking care of the batteries. The Willard storage battery is used on a number of different types of gasoline automobiles as a part of the electric starting equipment, and more than 80 per cent of the American makes are said to use this battery. It is being used to a considerable extent also for the lighting of railroad cars and the propulsion of electric vehicles. In regard to the battery equipment of most electric vehicles, Mr. Gassaway declares that the batteries are not made heavy enough. The conditions with a light battery and a heavy truck, he states, are the same as those with a lean horse and a heavy truck—they are both overworked and cannot give proper and reliable service.

Electrics in New York City

In New York City there are seventy-five different industries using electric commercial vehicles. Brewers are the largest users, nineteen breweries using a total of thirty-four electric trucks.

Seventeen department stores use 262 individual cars. Seven express companies have a total of 197 trucks.

New York bakeries are strong "boosters" of the electric. There are already 161 vehicles in this class of service.

In the central station service there are 150 cars. General delivery vehicles total sixty-eight. Eight meat packers employ sixty-seven electrics.

Forty-four vehicles are used by jewelers and thirty-five by wholesale dry goods stores.

Second Annual Outing and Picnic

Electric Vehicle Association of America and the Chicago Garage Owners' Association will hold their Second Annual Outing and Picnic, Wednesday, August 12, 1914, at Palos Park, Ill.

Last year the outing was a grand success and it is expected that this year's event will prove to be a greater success. Members of the associations and their guests are all welcome to attend and join in the festivities of the day. Special train and automobile service has been arranged for by the picnic committee. Tickets can be secured of members of either association at $1.00 a piece.

Fifty-two Miles for 10 Cents

A Waverley electric 1,000-pound delivery wagon recently made a trip from Buffalo to Lockport and back, bringing a 900-pound load on the return trip, in a total running time of three hours and a half.

The current used on the round trip was 105 ampere hours, which, at regular rates in Buffalo, amounted to less than 10 cents.

On another occasion the same car made the same round trip and about 18 miles of additional travel, or 70 miles in all, on 130 ampere hours, all at highest speed, the battery having a capacity of 150 ampere hours.

"Safety First at Albany"

The Albany Automobile Club has launched a "safety first" campaign in Albany, N. Y. The members have undertaken to educate the people of the city to the need of protecting themselves from traffic dangers. The club has caused large posters to be placed conspicuously about the city. It has distributed literature to the people generally and to numerous organizations in particular; it has been given cooperation by the school department and the school children have been advised by the distribution of printed suggestions. The club has undertaken to influence drivers of all vehicles to observe the laws and ordinances governing street traffic, and has sought to have the regulations enforced should there be any disposition to disregard them.

This is a Walker Electric Vehicle

The Electric Vehicle for Your Business

We have sold Motor Vehicles to men in many fields of work. They surely investigated Motor Vehicles before they made any purchase. The final decision was Walker.

This decision was due to the use they found other firms realizing from the Walker. You too, will decide on a Walker once you know it.

Walker Vehicle Company

531-45 West 39th Street : : CHICAGO

Electric Vehicles—Their Delivering Value

The proof is in their use

The streets of Chicago are traversed every day by hundreds of Electric Vehicles owned by some of our largest firms, such as, Marshall Field and Company, American Express Company, Ward Baking Company, etc. They are doing the delivering for these companies continuously; they are giving them the service demanded.

Electric Vehicles have been given the real test. They have a record for reliability.

Let one of our Electric Vehicle Experts give you the fund of information we have on Electric Vehicles.

Telephone Randolph 1280

Commonwealth Edison Company

120 West Adams Street : : CHICAGO

ELECTRIC VEHICLES

Vol. 5 CHICAGO, AUGUST, 1914 No. 2

A GENERAL VEHICLE TRUCK IN THE VARNISH TRADE

A RECORD!

Made by a Detroit Electric Roadster

EQUIPPED WITH

Philadelphia Thin Plate Storage Battery

[From Transcript of July 27]

NEW RECORD BY AN ELECTRIC

Trip from Boston to Philadelphia Is Made at Average Speed of 25.4 Miles an Hour

Motoring history was made this week in a run from Boston to Philadelphia by an electric roadster. The account of the trip reads more like that of a powerful gasoline car than of an electric, which in the minds of many is still associated with jogging about town, never out of reach of a convenient charging station. The run was conducted by R L. Heberling of the Philadelphia Storage Battery Company, and was made to demonstrate that the electric can be used for long distance trips as well as for town work, etc.

Left Boston 3:57 A. M. June 23.
Arrived New York (80th St.) 1:15 A. M. June 24.
Actual running time outside of city limits 9 hrs. 26 min.
Average Speed 25.8 miles per hour.
Time consumed in recharging, running through cities and miscellaneous delays, 11 hrs. 52 min.

Left New York 1:15 A. M. June 24.
Arrived in Philadelphia 1:47 P. M. same day.
Actual running time outside of city limits 3 hrs. 31 min.
Average speed 24.3 miles per hour.
Time consumed in sleeping, recharging, running through cities, etc. 9 hrs. 1 min.

It will be a pleasure to furnish you with complete information and particulars on the possibilities of the batteries which made this record possible, and their applicability to your car.

Philadelphia Storage Battery Company

BOSTON OFFICE AND SERVICE STATION

Piedmont and Ferdinand Streets, Boston

Published Monthly By
ELECTRICITY MAGAZINE CORPORATION
Monadnock Building
CHICAGO

Entered at Chicago Post Office as Second Class Mail Matter

ELECTRIC VEHICLES

WITH WHICH IS INCORPORATED IGNITION
TRADE MARK REGISTERED IN THE UNITED STATES PATENT OFFICE

SUBSCRIPTION PRICE
Domestic - $1.50
Canada - - $1.75
Foreign - - $2.00

FOR SALE AT ALL NEWS STANDS

If Your News Dealer Will Not Supply You—Please Notify Us

Volume V | CHICAGO, AUGUST, 1914 | Number 2

Boston to Philadelphia in an Electric Roadster

Detroit Electric Equipped with a Philadelphia Storage Battery Proves Real Ability for Cross Country Runs

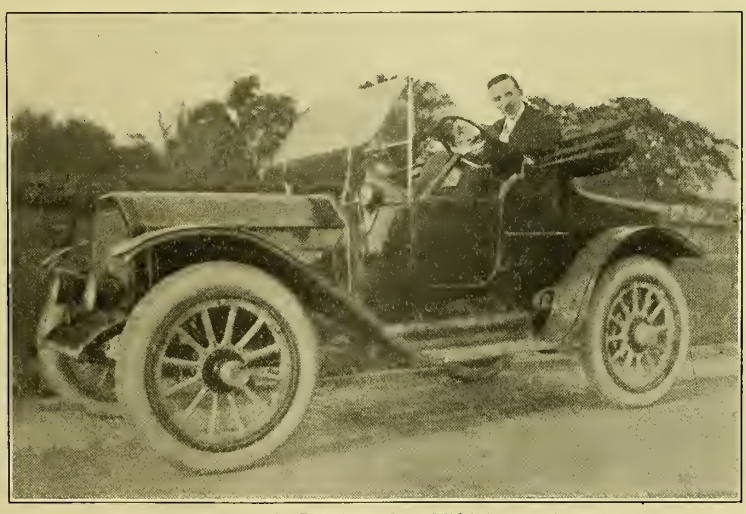
BY RALPH SEIDLER

ONE of the most remarkable runs ever made by an electric automobile was recently concluded in Philadelphia. The trip was undertaken to demonstrate the adaptability of the ordinary electric automobile for touring purposes, when suitable battery and tire equipment is installed; also the feasibility of boosting, that is, re-charging, lead batteries efficiently and expediently. The car selected, a Detroit roadster, equipped with Goodrich Silvertown cord tires, was driven by R. L. Heberling, Philadelphia, sales manager of the Philadelphia Storage Battery Company.

The motive power was furnished by a 44-cell Philadelphia thin plate diamond grid battery. Mr. Heberling made a trial run from Philadelphia to Boston, and on his return trip was accompanied by a representative of the *Boston Transcript*, in a semi-official observation capacity.

The trip was made in an elapsed time of 33 hours and 50 minutes, although the actual running time between city limits was but 12 hours and 57 minutes. This time shows an average speed of 25.4 miles per hour, an average which compares favorably with that of high-powered gasoline cars.

The start was made from Park Square, Boston, at 3:57 a. m. A cut across town was made to Commonwealth avenue, turning them into that superb boulevard which leads one through some of Boston's most beautiful suburbs to the pleasant country roads of Middlesex county. As the car approached the extreme hills, the driver with vague apprehensive fears of an electric's inability to cope with the hills, experienced that curious feeling within that we all remember as an elementary emotion of the "old days" when "one lung" cars and others of the period approached a hill with fearful coughing and rending of vitals. Would it go over—would that little, whirling humming motor beneath, drive almost two tons of automobile and passengers over the top of the incline ahead? And almost simultaneously the car was rolling down the other side. This little demonstration removed all qualms of apprehension.



R. L. Heberling and the Detroit Roadster Which Made a Record Run.

Leaving Commonwealth avenue the vehicle passed over the winding Charles into Weston, just as the sun was breaking its way through the fog which hung low over the country; for a number of miles through this country, now up hill, now down, now through a thin fog-bank in a valley, now on a hill where a downward glance showed strange white rivers of mist running through the valley below. Past the famous Wayside Inn, once the rendezvous of musicians, poets and litterateurs, the trip was without accident to Worcester, arriving there as the factories and shops were opening for the day. Here we were obliged to make a tedious detour to reach the charging station. Following a boost of an hour and a half we took our departure back through the city to the main road. I deem it not improbable that one thoroughly familiar with the route might save considerable time in making this trip by branching off from the main road before entering the city and going direct to the charging station, thereby avoiding the necessity of a side trip in a radically different direction than by the main road.

Almost immediately after leaving Worcester we ran into the worst two hills to be met with in the entire trip, Leicester Hill and Spencer Hill. These are miles long, but we

climbed them very steadily perhaps 8, 10, or 12 miles per hour to the top. This compares favorably with what many gasoline cars would do. Leicester Hill bears a close relationship to the far-famed Dead Horse Hill, being in the same range, but a little north of this well known hill race course. Not long thereafter we had the only noteworthy mishap of the trip, though this had its ludicrous side. The accident occurred when passing through West Warren. Here road repairing was in progress on the state highway and the road was partly obstructed by a two-horse team and wagon. Five laborers were engaged in throwing gravel on the road and as we passed between the wagon and the fence one of these laborers, quite unnecessarily, ran out to pull the horses over. To avoid hitting the man Mr. Heberling slid the car into the fence. A hasty examination revealed the facts that each wheel on that side was solidly wedged into the dirt against an 8-inch post; that the mud-guards were crushed up like crepe paper, the frame was bent, lamp brackets twisted, front axle bent and the spring leaves out. A half hour's work sufficed to extricate the car and make such repairs as were necessary to complete our trip to Philadelphia. The feature of the mishap was the positively terrific effort made by four of the laborers to lift the whole car out into the road, on the supposition, presumably drawn from its appearance, that it was a light gasoline roadster. The feat was finally accomplished by jacking the car up and throwing it off the jack. At Springfield we had a good charge, and a good lunch while charging, which by this time we were much in need of. We were fortunate in wriggling out of Springfield about two laps ahead of a parade, and found ourselves shortly on almost ideal roads down through the fertile red soil of the Connecticut Valley. Here it was that we made the fastest lap of the trip, and one of the prettiest, too, for the suburbs of Springfield and the Connecticut Valley towns are exceedingly beautiful, the broad finely kept roads flanked with rare old mansions and lined with magnificent elms, maples and other trees forming a perfect avenue of beauty nearly all the way.

Our time for this lap of 27½ miles was 55 minutes—exactly 30 miles per hour. At Hartford we charged but 50 minutes and then resumed our way to New Haven, which we reached about time for a 7 o'clock dinner while charging. After leaving the station we picked up an urchin who guided us well on our way to Bridgeport. He was the first of a number of misguided folks whose only answer to a request for direction was "straight ahead" or "follow the car tracks straight ahead," which not infrequently meant to follow them all around Robin Hood's barn, but finally we passed through Bridgeport on our way to Stamford, which we reached about 10 o'clock. This last named stretch was one of the most amusing of the trip and served to demonstrate most effectively the wonderful capabilities of our little car. It was with no small measure of satisfaction that we would creep up behind some gasoline car, our immense searchlight shining like 60 horsepower, touch the Klaxon and then roll past the man in front, silent as a bird at full speed, as he swung out, while we rang our electric bell to appraise him of the nature of the vehicle that had passed him. More often than not this led to an exciting race for a few moments, and we usually won out, particularly if we had the advantage of even the slightest down grade. One of these races extended for 4 or 5 miles or more, and we eventually lost on a bad hill.

After leaving Stamford we ran into bad fog and this pulled down our speed average somewhat. Shortly after getting into New York we met a horse patrolman, who ordered our searchlight out, and a few moments later we picked up a gentleman who guided us cross-town to the Weehawken Ferry.

The fog was particularly troublesome through Jersey City and across the meadows to Newark. There we arrived at the station about 2:45 a. m. The strain of driving through the fog after so long a ride had completely exhausted us, and though we had intended going through to Philadelphia we were obliged to give up the plan and discover one of Newark's so-called hotels for a rest. After awaking the clerk we registered and retired. We were awakened after three hours, had breakfast and shortly started on our way to Philadelphia, Trenton being the next intermediate stop. About the only delay on this jaunt was the necessity of waiting for a train with a hot-box, which very conveniently stopped squarely across the road. Twenty minutes covered this delay, however, and a short charge at Trenton sufficed to carry us through to Philadelphia, where we arrived at the factory at 1:47 p. m., concluding a most noteworthy electric automobile run.

From what I know of the state of mind of many electric auotmobilists, and the general public, in fact, that is to say, the light in which they view the capabilities of the electric automobile, I feel that the exploitation of such trips as this will do much to disseminate knowledge of the hitherto unknown possibilities of the electric automobile, and consequently stimulate popular use.

Electrics in Vienna

The electric mail wagons recently adopted by the Vienna postal authorities have been subjected to a test of 312,500 car miles, lasting over 15 months. At the conclusion of this test, 45 vans of 2½ tons capacity were placed in service. Lead batteries of 42 cells are used having a capacity of 300 ampere-hours at a 5-hour rate, and a maximum charging rate of 60 amperes. The weight of these batteries is 18 hundredweight, with a normal range of 22 miles fully loaded. The motors used have a maximum output of 15 horse-power, are series wound and are housed in the wheels. The garage is partitioned for each vehicle, and provided in its basement with charging equipment. For handling the batteries an elevator rises beneath the vans, so that the discharged batteries may be unshipped and replaced by fully charged ones. The weight of each van fully loaded is 6½ tons.

Requests Agency

An American consul has forwarded a copy of a letter to *Daily Consular and Trade Reports*, No. 12920, from a business firm in Scotland desirous of obtaining an agency for a good commercial electric vehicle of American manufacture for carrying 1 to 3 tons, the usual load being 1½ tons. The firm states that it has large machinery showrooms and does its own mechanical work; also has an extensive experience with electric motors, having been engaged in electric-power installations for the last 14 years. The firm would be willing to take the chassis and build the body and paint same over if necessary.

Electric Garage Equipment and Management

Thoughts and Suggestions Embodying the Building of an Ideal Electric Garage

BY H. M. MARTIN*

If one were given carte blanche to design a perfect electric garage, it would seem, off hand, to be a comparatively simple matter. Doubtless many automobile problems are now difficult; yet there is much food for thought, and many compromises have to be made before the ideal design can be adapted to working conditions.

Simplicity and cleanliness are the electric's prominent characteristics, and these ideas can be exemplified in an electric garage which is complete in every detail, and yet be in strong contrast to the more elaborate equipment and larger space necessary to garage and repair gasoline cars. Just at the present time electrics are enjoying prominence before the public, and justly so, because of the increasing cost of gasoline and the decreasing cost of charging current. As far, though, as the price of fuel is concerned, it would be well to take the utmost advantage of this situation while it lasts, since probably the near future will see the successful introduction of a fuel heavier even than the present liquid that is by courtesy called gasoline. But this is a digression.

Dr. C. P. Steinmetz Inspecting a Detroit Electric.

The location of the garage should be central with regard to the places of business of its customers. Since customers are not usually promised in advance, other conditions assume greater importance. If possible, it should be located on a well-paved street near a main artery of travel—and here we find the first necessity for compromise, since property of this description will probably be too expensive. If there is any choice in altitude, the lower should be chosen, in other words, at the foot of a hill rather than at its summit. For the same reason, the ground should be only an inch or so above the sidewalk or street level.

This brings us to the building itself. The number of floors will be determined by a compromise between the cost of ground and the cost of additional vertical construction with all that that implies, elevators, etc. Particularly if there are many floors, the elevators (of which there must be at least two) will be of as high a speed as good judgment will allow, because on the elevators' speed will depend the number of cars that can be accommodated. This is true because in a commercial garage practically all the cars have to leave the building between 6:30 and 8 a. m. With three men to an elevator working lively, but not to the point of danger, it takes from twenty to thirty seconds to move a car on and off. If the average floor is sixty feet from the ground, it means that to get one car down every minute and a half, the elevator must run a speed a little better than 110 feet per minute. This is all right for small cars, but if larger ones up to five tons have to use the same elevator, then an automatic device should be installed, cutting out resistance in the elevator motors' shunt field, and reducing the speed to about 60 feet. In this way the apparatus itself takes care of increased load.

Electric control from the car should, of course, be employed instead of the usual hand rope. The electric control precludes the possibility of starting the elevator by anyone not on the platform itself. Automatic gates will prevent, nine times out of ten, the serious accident of having a car fall down the shaft. This usually happens when the platform has been moved without the knowledge of someone about to back a car upon it, and who sees his error too late. If the car is pushed by hand, or is moving slowly under power, a comparatively light barrier will stop it; but if it has attained any considerable speed it is doubtful whether any of the devices in use at present would not bend out of their guides and become useless.

It is preferable to have no posts to interfere with the free movement of cars, though to leave them out will add materially to the initial expense and make the floors thicker, and the whole building higher. If posts must be used, let them be spaced with regard to the number and sizes of cars that are planned to stand between them. They should be provided with baseguards, which will prevent damage to projecting parts of the vehicle. Wall guards are equally important, so placed that the tires will strike them before any part of the car can hit the wall.

Concrete floors should be painted with a preparation giving them a smooth surface, which is easily cleaned and saves the concrete from wear, and accumulation of gritty

*Read before the Motor Truck Club.

dust. These floors should be pitched slightly from the center line down to the side walls, both ways, with gutters formed in the concrete along the walls, so that washing may be done, if necessary, without moving the cars.

Lighting should be well distributed, and each floor's lights controlled in several groups for the sake of economy of current. Around the walls, at frequent intervals, receptacles should be installed for drop cords so that these need not be of an unhandy length. The wall receptacles should be of sufficient capacity to take care of a portable drill.

Large windows are a good feature, and should be placed to allow the maximum of light and ventilation. This means a high window, which has many other advantages.

The heating system should be ample to keep all floors, where cars are stored, up to at least 60 degrees during the coldest weather. This is essential in order to start the batteries out warm. A gasoline garage can get along with any temperature above 32 degrees, but not so with the electric station.

The charging equipment, switchboard and wiring should be of approved type, solid and well erected. This apparatus is so standardized that no special remarks are necessary except to suggest that rheostats are usually grouped as closely together as their frames will permit, and should be ventilated in the summer. Many switchboard rooms are intolerably hot during the warm months. In addition to this, charging plugs should be suspended in such a way that when dropped they will not strike the floor. Local conditions must decide whether, if several floors contain vehicles to be charged, one switchboard should control them all, or whether each floor should have a separate one.

Ventilation should also be well looked to in the battery repair room, for here batteries are often gassing for a day or more on their initial charge. The floor of this room demands special attention, acid-proof brick or tiles laid in pitch being the best construction. It is of the utmost importance that the drainage system from this department—the entire distance to the sewer—should be either of lead or of glazed earthenware, and preferably run as "open plumbing"—not buried in the walls.

A small machine tool equipment is a very useful adjunct in an electric garage, even where most of the work is sent out. A lathe, drill press and emery wheel will do most of the odd jobs that come up from day to day. A more complete equipment would include a sharper, milling machine, and power hack-saw. If the garage is to be complete to handle everything that may become necessary, it should include well equipped carpenter and paint shops. There is much to be said in favor of this, since then a car need never leave the garage except for its daily work.

This brief review of the physical characteristics of the garage has touched only the high spots and has purposely left out many details, each of which should have painstaking thought bestowed upon it; for the smooth and efficient operation of the plant will depend in a large measure on the wise forethought of its design.

Management: In the first place, let there be one head to the entire system. If it is possible to combine in one person business ability and a thorough technical knowledge of the industry—then this is the desideratum. If not, then let the head be by choice a good business man, with a broad enough mind to know his limitations in other fields, and to have confidence in his well chosen technical subordinates. Many failures in management have resulted from trouble between executives vested with co-ordinate powers; or again, where large stockholders have held office with no qualifications for office holding other than stock holding.

From the head, direct lines of responsibility should radiate down to the most unimportant employe, so that each one shall know the scope of his work and its relation to the next move in the daily cycle of events.

There are a number of important questions that come up for decision almost daily in the operation of a garage. For instance, shall the customer be billed for accidents which may have been preventable? A chain comes off because a strut rod loosened. A controller finger burns, or freezes, as the case may be, because the contact was rough. A chauffeur is arrested and fined for having no tail light—the bulb being burned out. You will note in all these cases that

Woods Electric's Baseball Team, Philadelphia.

there is room for argument since it is possible to say that a perfect inspection system would not have allowed the accident to occur. There are some garage managers who regard such accidents as those just mentioned in the light of acts of Providence especially provided to furnish them a source of revenue. In general, it may be said that a public garage cannot afford to have as many really preventable accidents as a private garage can. That is, a public garage will suffer in its standing among others, and get a bad reputation if too many accidents happen. A customer whose single car is unwarrantably laid up for half a day will naturally make no end of a row about it, for, aside from the extra expense, all his plans for the day's work are upset. Perhaps I can state the case more tersely by saying that breakdowns in the case of a private garage may, up to a certain limit, cost less than the inspection necessary to prevent them, where as in a public garage very few strictly preventable accidents can occur without unfavorable comment and possible loss of business. This is not intended to justify preventable mishaps in either case—it is only a comparison of results. In point of fact, it takes only a very few accidents to equal the cost of a system adequate to prevent them.

Another question is, just what repairs shall be included in the flat monthly rate? Minor adjustments are conceded without extra charge, but there are a number of repairs that become necessary from time to time that hardly come under this head. An owner asks to have his smashed tail light straightened out, or new licenses put on, or perhaps says: "Just lend me a bell, or a spring, or an armature (as the case may be) until mine is repaired." The word *just* indicating that he does not expect to be charged for the service. Sometimes it is hard to decide just how far generosity can be stretched, but as a rule it all depends on the customer's record. Of course old cars require more incidental repairs than those of recent years, and to do any free work on them that should be charged encourages the owners in keeping them going. If I am credibly informed, there is at least one manufacturer of electric commercial cars which always scraps an old car of its own make when taken in trade, instead of giving it a coat of paint and selling it again. This policy is much to be commended, since it rids the electric vehicle world of an undesirable citizen, and raises the average of efficiency of the cars that are running.

At present rates charged for garaging, the small cars are the ones that pay the dividends. This is not because the rates are so for from equable, but because the small car on the average does not carry so large a proportion of its possible load as does the large one. A five-ton truck is chosen and purchased for certain work because that—and often a great deal more—is the load to be transported. But the light car is bought, perhaps, to replace a horse and wagon in doing odd jobs, or with the idea of being up to date, or again, with an eye to some advertising advantage.

In dealing with the owners of commercial cars, as a rule it is only the recent purchaser who is unreasonable and not willing to meet the garage management half way in the matter of disputes on bills or service rendered. A recent case is reported of a new car that ran to perfection for two weeks while being operated by the factory demonstrator, but after he left it was in constant trouble. The owner complained bitterly that his car was not being charged, and it was with great difficulty that he was finally convinced that the new driver was running the car with his brake set.

Most of the road accidents that can happen to electrics are easy to diagnose, and should cause the management no particular worry if the driver has had enough training to enable him to report the important symptoms. A few of the most common ones just as they come over the wire are as follows:

1. My car was running all right, but stopped suddenly. Lights are O. K. (broken wire not in battery).
2. The same, but lights are out. (Broken strap or connection in battery.)
3. Car was all right up to fifteen minutes ago, when I noticed it was slow; now it will hardly crawl. (Leaky cell.)
4. Car won't start. Helper has to push it. When it does go, it bucks like a broncho. (Loose brushes.)
5. No power on first or second notch, after that O. K. (Broken resistance.)
6. No power on any but the last notch, and slow at that. (Broken field connection.)
7. Motor seems to run O. K., but car does not move. (Broken armature shaft.)

There are a dozen other combinations of these basic troubles besides the usual run of mechanical failures.

Pleasure cars: In dealing with the owners of pleasure cars, many of these owners have no special interest in understanding the workings or limitations of their cars, and consequently there is no common ground on which an argument can be based. On the other hand, some owners consume a lot of the garage manager's time in arguments and explanations of "how it all happened." Both the commercial car manager and the pleasure car manager have all they can do to analyze each case. But the simplicity of the electric vehicle does not allow much room for breakage. A garage equipped with help who really understand the few technical arrangements of the electric can easily adjust properly the parts which are out of order.

Stop, Look and Listen

Railroad officials throughout the country note that accidents to automobiles on grade crossings appear to be increasing at an alarming rate. An official of one of the principal roads in the country is authority for the statement that fifteen out of every hundred persons killed or injured in grade crossing accidents are occupants of automobiles. On this basis there were approximately 300 persons killed and 750 injured driving automobiles over grade crossings in the two years ending June 30, 1912, and while complete figures for the succeeding years are not available, the frequency with which such accidents occur would indicate there has been no diminution, but rather an increase, in this class of accidents.

On three important crossings on a large eastern railway system a test was recently made to determine with what degree of care the average person approached and crossed the tracks. During a period of eight hours 923 automobiles crossed the tracks. Of that number the drivers of 801 cars, or 87 per cent, did not look in either direction along the tracks before crossing. There were 83 of them, or 9 per cent, who looked in only one direction, while only 39, or 4 per cent, took the precaution to look both ways. The automobile accidents that occur on crossings are most lamentable, the victims usually being men or women of intelligence and good social standing. What makes it all the more distressing that these accidents should occur, is the fact that a little ordinary care and caution on the part of the drivers of cars would prevent them. The rule of stop, look and listen should always be faithfully observed at railroad crossings. But few persons properly observe these three words of caution. Oftentimes an accident is the result of attempting to cross the tracks on high gear with the result that the machine gets stalled on the track and before the gear can be changed and another start made the accident has happened. Drivers should always approach and cross a railroad crossing on low gear, and never fail to "Stop, Look and Listen" before crossing.

Electrics Extend Business Radius

Six General Vehicle electric trucks are used by the Lincoln Safety Deposit Company covering a radius of 35 miles. The company finds that the machines transfer goods between the safety vaults with less liability and more economically than by any other transportation methods formerly used.

Vehicle Garaging in London

England is exceedingly limited in the use of private cars, but there is a considerable number of electric taxicabs, particularly in London, which are kept for hire. The common practice among automobile owners is to use the gas car for touring the country and to depend on the public taxicabs for transportation within the metropolis. The congested character of the traffic in most London streets and the vast number of public automobiles everywhere at hand for hire, cause the owners of passenger cars to refrain from risking them in the congested streets to any great extent.

The motor-car owners who have country places generally keep their vehicles garaged there, and when making visits to London by motor leave them in garages at the edge of town and employ taxicabs.

To meet this town demand there are several electric passenger-car garaging and renting concerns, besides those which provide gasoline cars in a like manner. Chief among the electric-car companies are the Hertford Street Motor Car Company (formerly the Electromobile Company), and the Krieger Electric Carriage Syndicate. Both do garaging and charging for a few private owners, but their business consists chiefly in letting out vehicles, with drivers, for the trip or by the day, week or month.

The Hertford Street Company's premises are centrally located in the West End. The company has about 300 cars, mostly of the prevailing taxicab type of body, convertible, and accommodating two or four persons inside, the driver's seat being under a hood outside.

In some cases a car may be obtained there for service by a regular patron, and his coachman or chauffeur operate it, but generally the company's driver accompanies the vehicle on all trips, which are engaged for by telephone, on instant notice if required.

The vehicles, which are of substantial construction and valued at about $3,000 each, are kept in an ample garage, with pleasant office and lobby at the front. In the center of the entrance area of the garage are three elevators which operate between this floor and the basement. When a car comes in from a trip, it is run over the elevator well and the elevator on which stands a truck on a section of track, is raised to the battery box, which is suspended beneath the car; two bolts are unscrewed and the battery, thus freed, is lowered to the basement, where a line of track extends in both directions the length of the room, and from it tracks run in parallel lines to the walls on either side. There is track room for 400 batteries each on its respective truck. The batteries are of the lead type, consist of 5 cells, and weigh 1,100 pounds.

At one end of the basement is the company's private substation with five motor-generators installed, capable of providing 4,000 amperes. Current comes in from the central station at 400 volts and the charging is done on 110 volts pressure. Leads from the generators are carried along the ceiling of the basement to the battery-truck area, where the charging is done. Meters are installed in front of each track, on the beam above. As soon as a battery is removed from a vehicle, a charged battery is sent up on the elevator and attached to the car. The process of replacing a charged battery for a spent one can be accomplished in as short a time as two minutes.

Batteries are assembled and old ones furnished with fresh plates in the battery room in the basement. The advantages gained from the uniformity in the construction of both the cars and of the batteries are obvious, in that the units are entirely interchangeable.

For the few "foreign" or outside cars, charging facilities are provided on the ground floor for three.

The headquarters of the Kreiger Company are near the Victoria station, in Westminster, readily accessible to a fashionable residential neighborhood. The company's vehicles number about 60, for hire, and a half-dozen more are garaged for private owners. The cars are of the landau or landaulet type, of a very "smart" pattern, and the driver's seat is without a hood, thus differing from other electric cabs and gasoline taxicabs. They are mainly of French manufacture and have large back wheels, which add to their comfort.

The batteries are of 46 lead cells, and are divided, half being located under the front seat and half in a box under the rear of the car.

The company's charging equipment consists of two 50-kilowatt motor-generators receiving current at 400 volts and charging on 120 volts pressure, with the batteries remaining in the cars.

The company has a machine shop with motor-driven lathe, and does its own repairing and painting.

The general outlook for the electric-vehicle industry in England is generally recognized to be more expansive, perhaps, for the commercial vehicle than for the pleasure or passenger car. One obstacle to the increase in privately owned pleasure cars is the multiplicity of central stations in London, with differing equipment. There are in London some 50 private and municpial generating organizations. The Electric Vehicle Committee of the Incorporated Municipal Electric Association is working for uniformity in rates and charging facilities, and already about 60 central stations in England have agreed to a rate of one penny (two cents) per kilowatt-hour for off-peak charging.

The usual rate for charging during the peak hours of 6 to 9 p. m. is 2.5 and 3 pence per kilowatt-hour.

Truck Statistics

Hammacher-Schlemmer & Company, of New York, is using electrics of G. V. make. The fleet now consists of two 3½-ton, two 3-ton, one 2-ton and one 1-ton truck. They have had a 3½-ton in use since June, 1911, and the other since June, 1912; one 3-ton has been in use since December, 1904, and the other since July, 1907; the 2-ton truck has been in use since June, 1912, and the 1-ton truck since September, 1910.

The trucks cover from 20 to 35 miles per day on the different routes, and the 3½-ton trucks are guaranteed to run 40 miles on one charge. It also finds the electric truck average as economical as the horse trucks, and besides making nearly twice the mileage, enables it to make deliveries which it could not handle before the adoption of the electric trucks.

The company says: "We have figured out that a 3-ton truck costs $9.56 per day. This includes wages of driver and boy, garage current, batteries, tires, etc.

"The method we adopt for depreciation is as follows: Interest on investment, 6 per cent; insurance, 8 per cent; depreciation, 12½ per cent. By this you will see that the truck bought in 1904 was taken in December, 1911, at one-eighth of its original value, and on December, 1912, which was its eighth year, we took it off our books, so that we figure the life of a truck of this kind about eight years. The cost, including these items, amounts to $12.48 per day."

The Safe Operation of Passenger Electrics

Facts Which Every Owner of an Electric Should Know and Put into Practice

THE evolution of the automobile, from the slow, uncomfortable, cumbersome, and mechanically imperfect conveyance of the past, to the swift, dependable, luxurious car of today, has been attended by a correspondingly increasing amount of danger, not only to the operator of the car and his passengers, but also to the public at large. The number of accidental deaths in cities has largely increased since the advent of the automobile, and in country towns and on all public highways the danger of being struck by a swiftly moving car, in charge of an inexperienced or careless driver, is always present. Even the careful driver may not entirely escape accidents, because many injuries are direct consequences of carelessness or inattention on the part of pedestrians and drivers of other vehicles. Some of these accidents may be avoided by constant watchfulness on the part of the automobile operator, but in other cases no amount of care will enable him to escape them.

There is no doubt that the blame for many accidents is unjustly laid upon the shoulders of the automobilist, and it is equally true that the neglect of some simple precaution on his part has often led to serious injuries, or even to loss of life. The following suggestions are given in the hope that the risks to users of the public streets and highways may be lessened, and that the operation of automobiles may also be made safer for drivers and passengers.

One of the prime requisites in the safe operation of an automobile is a thorough and instinctive knowledge, on the part of the driver, of the uses of the levers and pedals that control the movements of the car. The seasoned driver does not stop to think what motions must be made to bring the car to a sudden stop in case of an emergency. When an accident seems imminent he instinctively throws out the controller and applies the brake, in a mere fraction of the time that would be required if he were obliged to think out each motion in advance. No person should attempt to operate a car in crowded traffic until he has acquired something of this manipulative instinct, and a beginner should not trust himself to drive a car under any circumstances, until he has received adequate instructions from a skilled and experienced operator.

Before leaving the garage the car should be looked over carefully to see that everything about it is in a safe condition. The steering gear and the brakes should receive particular attention in this respect, and loose nuts and other defective parts should be attended to in a thorough manner. The tires should also be examined for weak spots that may blow out while on the road, and tires showing such imperfections should be changed, if necessary, before starting out. Many accidents might be averted by paying proper attention to these points, and by making necessary repairs as soon as the defects are discovered, instead of waiting until a more convenient time.

When operating a car on the road the driver should listen for unusual sounds about the machine, and if such are noted he should make an immediate investigation to determine the cause. Any marked variation from the usual action of the car also indicates that something is out of order, and prompt measures should be taken to discover the source of the trouble, and to apply the proper remedy.

Attention has been called to the danger of allowing inexperienced persons to operate cars on crowded city streets, where the conditions are entirely different from those that are met with on public highways outside of the city limits, or in public parks. It is necessary, of course, to obey all local traffic regulations, and the driver should faithfully adhere to these regulations, even in the absence of traffic officers. When approaching a stationary street car that may be receiving or discharging passengers, the driver should proceed with extreme caution, and it is safer to bring the automobile to a standstill at a distance of at least eight or ten feet from the street car, and to wait until the passengers have reached a place of safety. Children, and even grown persons, often become confused and suddenly move in directions totally unexpected and unforeseen by the automobile operator, and he should be on his guard against behavior of this kind. The driver, when running the car near the curb, should always be on the watch for persons who may step from the sidewalk into the street without looking about them, or giving indications of their intentions in advance. The most careful person is likely to do this at times, through absent-mindedness or preoccupation, and it is only by exercising constant vigilance that the automobilist can avoid accidents due to this cause. Ordinarily, the automobile should be started cautiously after a traffic officer has given the signal to proceed at a street crossing, because some person is usually present who is impatient to cross, and who will try to do so in front of the car. The right of way should always be conceded, without hesitation, to fire engines and other fire-department apparatus, and if it is practicable to do so, the automobile driver should draw his car up beside the curb until all the apparatus has passed.

In many cities signs are now posted near schools, warning automobilists against fast driving at such points. These warnings and all other similar cautions should be faithfully heeded, and the necessary precautions should be taken to prevent accidents. It is best to avoid the neighborhood of schools altogether, so far as this is practicable.

A suitable warning should be given by a motion of the hand, or in some other manner, before backing the car, turning it around, crossing from one side of the street to the other, turning into a side street, or coming to a stop. If he considers it safe to do so, the driver should glance backward for a moment to see that his signal has been observed by the driver of any vehicle that may be following him, and he should never change his direction until he is satisfied that he has a clear course. Where streets intersect, precedence should be given, in every case, to a car that is following the main avenue of traffic, because any other course may lead to confusion and disaster. At corners where the view is obstructed by buildings, or by high bushes or trees, or in any other way, the

*Abstracted from *Travelers' Standard.*

speed of the car should be reduced and the horn should be sounded.

Accidents frequently result from the omission of proper precautions when leaving the car unattended temporarily. If the car is standing on an incline it is advisable to turn the wheels so that one of them will rest against the curb. If this is done there will be no danger of the car running away in case some mischievous or meddlesome person should release the brakes.

A recent accident, that occurred while one car was towing another one, is instructive and may serve to direct attention to a source of danger that is often overlooked. A man who was waiting to cross the street attempted to pass between the two cars, not noticing the rope that connected them; and before he could step back out of the way he was struck and injured by the car that was being towed. When towing, the driver of the leading car should exercise great caution in every respect. He should drive slowly and carefully, and should make it as evident as possible, to persons who are waiting to cross the street, that another car is attached to the one he is driving.

In addition to the suggestions that have already been given, and that are applicable more especially to the operation of automobiles in the cities and larger towns, there are others that should be mentioned in connection with the operation of cars on the public highways outside of the more thickly populated districts. Excessive speed is one of the chief causes of accidents, and many drivers have a mania for traveling at a high rate, even when there is no definite object in doing so, and when conditions make the practice distinctly hazardous. Except in special emergencies the speed of the car should be regulated to suit the condition of the roads and the density of the traffic. Much depends also upon the skill and experience of the driver, and the automobile operator who is constantly mindful of his own safety and of that of his passengers, will not willingly take chances of any kind. Laws limiting the speed of automobiles have been enacted in many states, and it is safe to say that if the legal speeds were never exceeded the number of accidents would be greatly reduced. Racing on the highways with other automobiles, or with railroad trains or trolley cars, is a dangerous practice, in which no driver should ever indulge.

Safety requires that drivers should always keep on the right-hand side of the road, except when passing other vehicles that are going in the same direction. In such cases the vehicle that is coming up from the rear should always pass to the *left* of the overtaken vehicle. There should be no exceptions to this rule, as any other course leads to confusion and may cause accidents. Some authorities maintain that an exception should be made when passing a trolley car, a furniture van, or any other large, high wagon or load, the size of which prevents the driver of the automobile from seeing ahead on the road; and traffic officers in some cities require automobiles to turn to the *right* in overtaking vehicles of this nature. Unless local traffic regulations require turning to the right, however, we are of the opinion that the rule to turn to the left in overtaking other vehicles should still be followed, even in these cases, although it is then especially important not to turn out too quickly or abruptly. A long sweeping turn should be made, at reduced speed, and preferably at some considerable distance behind the vehicle that is to be passed; and the driver should look sharply ahead in all such cases, so that he will see, at the earliest moment possible, any teams, automobiles, trolley cars, or pedestrians that may be in his course. When about to pass a vehicle from behind, an adequate warning signal should be given, and the speed of the car should be reduced whenever such reduction will diminish the likelihood of accident. A driver should never attempt to exercise his skill by turning in as closely as possible in front of the vehicle that has just been passed, but should allow plenty of room to avoid striking it. Similar rules should be observed when meeting a vehicle coming from the opposite direction, and plenty of room should be allowed in every case. Operators of large cars sometimes "hog the road" (to use an expressive though inelegant phrase), and fail to show proper consideration to the drivers of small cars and of horse-drawn vehicles. Conduct of this kind causes ill-feeling, and in many cases it is also extremely dangerous.

When making repairs on the road, care should be taken to move the car as far as possible to one side of the traveled part of the thoroughfare, and no tools, spare tires, nor other material should be left lying in the path of other automobiles. When changing tires or doing other work upon the car while on the road, or when getting out of the car for any purpose, a constant watch should also be kept, to avoid being struck by passing vehicles.

When approaching a frightened horse the speed of the car should be reduced, and if necessary the car should be brought to a standstill. Similar care should be exercised when approaching herds of cattle, the car being kept under perfect control so that it can be stopped very quickly. The car should also be kept under full control when descending long or steep grades. If it seems likely that the brakes are becoming overheated when descending a long incline, the car should be stopped and the wheels be securely blocked, until the brakes have become cool again. If the brake bands and drums are at a high temperature, they should not be chilled by pouring water upon them, but should be allowed to cool off gradually.

Special care should be taken when driving at night, and in fog, rain, and snow squalls. If the glare of the lights on an approaching car interferes with the view of the road ahead, the car should be slowed down or brought to a complete stop. When approaching unguarded railroad crossings the car should be stopped, if the view is obstructed in either direction, and one of the passengers should be sent ahead to see that all is safe. If the car should become stalled while crossing a railroad track, the passengers should immediately get out of the car and go to a safe place, meanwhile keeping watch in both directions, in order to warn the driver of approaching trains.

A few general suggestions that are applicable in all cases may be here cited. Intoxicated persons should never be permitted to operate automobiles under any circumstances, even though the intoxication is but slight. Drivers should be on the watch for children who may be "stealing rides" on teams, or who are playing in the streets or on the sidewalks. The operator should at all times keep his eyes on the road ahead; he should not turn around to talk with persons on the rear seat, and he should never remove his hands from the steering wheel while the car is in motion. If the steering apparatus or brakes are known to be defective or out of order, the car should not be operated until repairs have been made. The lights,

and particularly the rear light, should be kept brightly burning when driving at night; chains should be used on the wheels during rainy weather and when the roads are freshly oiled or are covered with snow; attention should be given to the proper lubrication of all parts.

The most important caution that can be given in relation to automobile operation, is to refrain from taking any known and recognized chances, whatsoever.

Safety should be the first consideration in every case, and recklessness and foolhardiness on the part of automobile operators should be discouraged in every possible way.

Care should be taken to avoid collisions and other accidents when entering or leaving a public garage, particularly when there is but a single door or passageway, which is used both for entrance and for exit. If the driver cannot clearly see where he is going, he should sound his horn repeatedly, and proceed very slowly and cautiously. If a doorman is in attendance, his signals should always be faithfully heeded. The reckless or careless driving and handling of cars in public garages should be prohibited.

Great care should be taken when transporting automobiles on elevators in garages. As soon as a car has been run upon the elevator platform the brakes should be set up tightly. All parts of the elevator and its mechanism should be frequently and carefully examined, and any defects that are discovered should be remedied immediately. A gate of special construction and strength should be provided at every landing. Failure to retain control of a car and bring it to a stop before it strikes the gate has caused many a serious accident, where nothing more substantial than the ordinary elevator gate has been in use. A heavy horizontal bar, made up of two angle-irons with a core of wood between them, and placed about twenty inches above the floor level, will furnish protection in cases of this kind. The gates should be provided with locks that can be operated only by the person in charge of the elevator.

Electricity is ordinarily used in garages to furnish the motive power for the elevators and for the various machine tools that are used in the repair shop, and all possible precautions should be taken to guard against accidents that may be caused by its use. Accidents are often caused by the arcing of switches on account of defective design, or because of lack of attention in operating them. Motor-starting switches having a no-volt release may cause accidents if they are allowed to get into bad condition, so that they fail to return to the starting position properly. In such a case a flash may be produced the next time the motor switch is thrown in, and the attendant may be burned. Accidents also occur when replacing fuses, because of poorly designed fuse holders. Before renewing a fuse the switch should always be opened so that the power is cut off. It is important for plug connectors to be of an approved type and well insulated, so that it will be impossible to get a shock from them. Flexible extension cords should be thoroughly insulated and should be kept in good condition; and they should not be permitted to lie in pools of water or oil that may have collected on the floor.

Good lighting is important in all parts of the garage and repair shop, and when sufficient daylight is not available an adequate number of artificial lights should be provided. These should be of an appropriate type, and they should be properly located, and provided with suitable reflectors. Nothing should be used but incandescent electric lamps. The bulbs inside the garage should be protected by wire-mesh guards. All feed wires should be placed in conduits, or be insulated in some other equally effective way. Fuse boxes and switches should be located where vapors cannot reach them.

All belts, pulleys, gears, exposed shafting, and other dangerous elements and places should be effectively guarded, and clutches or mechanical belt shifters should be provided wherever they are needed. Tools should be kept in good condition, and any that are broken and defective should be promptly discarded.

The stock rooms should be kept in an orderly condition, and all spare parts, stock, materials, and tools should be arranged in a neat and orderly manner. Tools and materials should not be left lying about on the floors, where persons may stumble over them. Particular care should be taken to keep passageways and stairways free from obstructions. Drivers of cars, repair men, and others who may have occasion to run cars, should carefully heed the suggestions that are given with regard to the operation.

Public garages usually provide compressed air for inflating tires and for other purposes, and thoughtless persons sometimes cause injuries to others by attempting to play practical jokes with it. This is an extremely dangerous practice, and it should never be allowed.

Many of the accidents that occur in garages are caused by thoughtlessness and carelessness, and others are due to lax methods, to the omission of thorough periodical inspections of the various parts of the building and machinery, and to other causes. Care combined with faithful attention to details of every kind, will result in a considerable reduction of these accidents, and will amply repay the owners of garages in many ways.

A New Electric Tractor

The accompanying illustration represents an electric tractor driven and steered by two couple-gear wheels, each having an electric motor inside of the wheel, driving at a single 25 to 1 reduction in balanced action at the periphery of the wheel.

As shown by the cuts, this is a quick detachable tractor which may be applied to almost any type of horse-drawn vehicle. In the lumber business, one tractor serves from three to six trailer wagons, according to the length of the hauls.

The tractor frame extends back of the battery box about five feet, and the two ends of this frame are beveled upward. Metal pockets are placed underneath the floor of each of the trailer wagons, having end openings flared both downward and horizontally.

The trailer wagons retain the upper half of the original fifth wheel in front. During the operation of loading, the ordinary front axle construction is used with horses hauling the load. Half of the fifth wheel is used, in connection with the horses, to drag the wagon to and fro to be loaded. After loading, the wagon is placed in some convenient spot, and a horse or jack put underneath the perch and the front axle removed. It is then ready for the trailer to couple on.

The tractor when detached is supported by its front driving wheels, and two small rear auxiliary

wheels. All four wheels are mounted on springs. The flared ends of the trailer pockets being cornucopia shape, are very easy to engage. When the beveled ends of the tractor frame strike the lower part of the front incline of the pockets, the tractive power of the front driving wheels pushes the rear frame extension up the incline of the pockets and back into position. The small auxiliary rear wheels of the tractor are then about 6 inches from the ground. An ordinary hook coupling with turnbuckle is used on each side to firmly couple the tractor and trailer together. The operation of coupling and uncoupling to a trailer is quicker than the same thing can be done with horses, or any other known tractor. When the tractor is detached, the center of gravity is placed well back of the front axle and enough weight is on the small rear wheels to preserve the stability of the machine. However, in case a reckless operator should stop too suddenly going down grade, or be brought up by a deep hole, stump, or curb, any tendency to tip forward is taken care of by the rounded pair of skids brought down under the footboards in front.

The Eldridge Tractor in the Lumber Industry.

The battery is placed on top of the frame back of the driver's seat, and is readily removable in a single unit by means of an overhead chain hoist and rail. In the lumber business, the hauls are long, and the loading and unloading very quick, so that high mileage with a tractor is possible. Two batteries are therefore furnished with each tractor, changeable at noon. The device has a capacity of three tons per load, and speeds of from six to eight miles per hour, which in the lumber business are the economical speeds.

It is also made to haul five tons at five to seven miles per hour.

The driver's seat is equipped with spring cushions and is placed low down on the front end of the frame, with dropped footboards, enabling the driver to sit under the forward ends of the long sticks of timber; with a top and storm front to protect him from the elements.

This tractor has been purchased by the Curtis & Pope Lumber Company, the largest retail lumber concern in New England, and is their third electric tractor, the other two being four-wheel drive couple-gears for loads of from five to seven tons. For the two-wheel drive, three-ton detachable tractor, three lumber wagons have been equipped, and three more are about to be, as the tractor can readily serve six trailer wagons on short hauls to and from the railroad.

The pockets for the tractor can be readily applied to almost any type of wagon, and the majority of the time usually spent in loading by hand saved.

Horse Vehicles in Decrease

Sixteen out of thirty-one of the principal American cities show a decrease in the number of licensed horse-drawn vehicles in relation to population. In seven cities there was an actual decrease in 1912, as is shown by statistics collected by an organization of horse interests for the years 1911 and 1912.

It is patent to any one visiting our large cities and many of the smaller ones the horse and mule is fast being eliminated by the auto, the auto truck, etc. The requirements of the age are such speed is a great desideratum and the automobile and like vehicles are most acceptably filling this requirement. Of course, there are some who endeavor to stay the course of progress in the matter of transportation, but their number is so small as to occasion no uneasiness. Every enlightened nation must advance; it cannot retrograde. People must be taken from place to place quicker and quicker than before. Time is a much greater factor than ever before in the history of the world. Why any reasonable person should oppose automobiles is more than *Southern Motoring* can understand. The figures we have presented, gathered by persons interested in the horse industry and naturally desirous of ascertaining the facts relative to the decrease of the equine species in the matter of transportation is sufficient evidence that the great bulk of our population is satisfied that the animal-drawn vehicle has served its purpose and are providing themselves with the gasoline and electric-driven car.

The tendency of the age is toward comfort and convenience. Our residences are being erected along sanitary lines. The best of plumbing is demanded. Electric lights predominate. In the over four years of its existence this publication has seen some mighty strides in the automobile industry and expects to see many more. In every issue we have articles relating to improvements and it affords us great pleasure to present them to our readers. The auto has come to stay until something better supplants it. This is likely to be a period in the far-away distance as the vehicle is being improved in so many ways as to make it seem impossible that anything can take its place. Some have suggested that flying machines will ere long be constructed in such a manner as to travel at a low height, so that in the event of an accident the occupants will not have far to tumble to reach Mother Earth. This may come to pass, but we believe that for a long time, the great majority of mankind will prefer to roll over the ground and not through the air. The automobile, as we have already stated, has come to stay a long time and continue to be the mighty factor it is in transporting mortals and freight and everything else portable from place to place; from town to town; from city to city; from county to county; from state to state; from country to country.

In the July issue of Electric Vehicles credit was given to S. G. Thompson as author of the moving picture film entitled "Selling Electric Vehicles," whereas W. C. Andrews, Edison Storage Battery Company wrote the story, S. G. Thompson being responsible for the scenario on which the films were based.

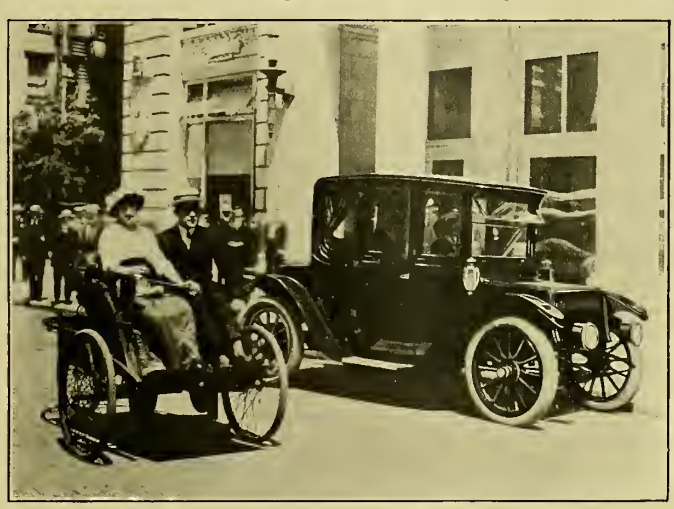
What the Electric Means to the Central Station

Methods Which the Memphis Gas and Electric Company Has Used in Introducing the Electric

CHARLES K. CHAPIN*

THE relation of the electric vehicle to the central station industry is not a new subject. Manufacturers from time to time have made an effort to encourage activity on the part of central stations, realizing that the electric once placed in service, is forever related to the lighting industry, and because of the nature of its use and demands, it behooves central station management to take an active part in the management of interests which are distinctly electric.

Great stress has been placed on the electric, as desirable business for that period of the station load when it is at a minimum. While this is most assuredly true, it is not the only reason for boosting electrics, as there are a dozen perfectly good reasons why central stations, manufacturers of vehicles and accessory manufacturers should leave no stone unturned in an effort to assist the wonderful advancement which is being made by this type.



Antique Waverley of 1893 as Compared with the Latest Model.

This community of interests accounts for the existence today of the Electric Vehicle Association of America, whose entire purpose is summed up in the one short slogan, "To promote the adoption and use of electric vehicles for business and pleasure purposes."

That central stations of this country are realizing their position as regards their relationship to the electric, is typified by the fact that in the recent advertising campaign of the Electric Vehicle Association, more than fifty per cent of the fund was subscribed by central stations.

The number of central stations in cities of fifteen thousand population and over, who are not taking an active interest in the growth of the electric, is so small as to be ignored; but let us compare one policy with another, and I am sure that we can agree how we may accomplish greater good for the cause, without over-burdening either our finances or the physical organizations of our respective companies.

So many advocates of new ideas lose the support to which they are entitled, by suggesting such radical changes in one's organization, that the benefits to be derived are entirely obscured by these necessary changes, before any results can be expected. I wish to suggest to you and show you what a wonderful showing can be made; demonstrated without in any way calling for such changes, as might cause you to hesitate.

The bare statement that we have shown a two hundred per cent increase in each period of two years, is sufficient, and this without a sales organization, nor an employe whose salary is not paid by the vehicle department itself—certainly such a showing warrants a most careful study.

It is desirable to offer all the inducement possible in the way of minimum cost of current, while still giving a proper return to the central station, and in making a study of the cost of service we immediately are convinced that either our regular power rates or better are not too low for this classification of very desirable business.

That this condition is understood equally well throughout the country, was shown in a report to the Electric Vehicle Association, which covered eighty-two cities in this country, having a population of 25,000 and over. We are just as sure of the progressiveness of central stations in cities of less than 25,000, as some of the best campaigns to promote the electrical industry have had their origin in such cities.

In a greater number of cases, the commercial power department exercises authority over the electric vehicle business, and where there is not too much work of this nature, such an arrangement is eminently satisfactory.

It is not a difficult matter to obtain information of any nature, if we understand the subject sufficiently well to ask the proper question from the best source available. Volumes of data are obtainable, and, in fact, we have reached the point where manufacturers of vehicles and batteries are strenuously endeavoring to condense this information and arrange it so that it can be more readily obtained and more easily assimilated.

Armed with a limited amount of experience and a world of tact, it is possible to have the prospective customer in a sufficiently receptive mood to warrant a call from a vehicle manufacturer's representative—then leave it to him. Do not attempt to do it all. If there is a remote chance for a sale, he is the one best equipped to close the transaction.

Do not be afraid of hard feelings, if you report prospects to more than one company. It is their business to sell in a competitive field, and the more your prospect studies the various designs submitted, so much more will it become apparent that the electric is a meritorious vehicle, built to stay *put*, and well

*Chief electrical engineer Memphis Consolidated Gas and Electric Company.

justifies any and all the claims which are made for it.

The next essential is detail mechanical and electrical knowledge of the principles of operation of electrics. This should be well fixed in the mind of one or more of the power department engineers, in order that the confidence which we have taught our customers to have in us will not be misplaced.

Simple little problems in mechanics or electrochemistry are ofttimes but forerunners of success or failure, depending upon the thoroughness with which we dispose of them.

This engineer, or inspector, which I prefer to call him, should go just as far toward assisting in the care of electrics, both pleasure and commercial, as the individual case seems to warrant. You will notice I am neglecting entirely the question of selling agency agreement, between the central station and a vehicle manufacturer.

For this reason—it is necessary in order to fulfill the first function of an agency to have a demonstrator. Now part of this hesitancy about boosting electrics is because most companies do not feel justified in purchasing an elcctric to be kept as a demonstrator and maintain a sales organization in addition. Buy your demonstrator by all means—and put it to work, real work, and when you get more than it can do, buy another one. A demonstration of your confidence in the electrics, by using them yourself, is of more value than a demonstrator sitting in a show window, and only seen on the street occasionally. True, there will come a time when a demonstration of a commercial or a pleasure vehicle is all that remains to insure a sale.

That is the time for you to offer one of your own vehicles, furnish it with a driver, and then see how much more chance you have, not only of assisting with a sale, but of forever installing yourself on the right side of your customer—an asset which never surfeited a public utility.

Many of our own costs are easily reduced by substituting electrics for horse-drawn vehicles, and we have made a distinct step in the advancement of our own best interests when we realize this fact.

The use of electrics by central stations in the routine of their own business is prima facie evidence of efficiency study, and progressiveness is forced onto us in the southern cities by the wonderful strides made in civic improvement of streets.

Bear in mind that while the warmer climate is most favorable to battery efficiency, it is also the most murderous to horse flesh. As we pass through our parkways, where pleasure vehicles have almost entirely superseded the animal, we are impressed with the cleanliness of the drives and walk-ways, and our minds immediately revert to crowded, slow moving, dirty thoroughfares, where old methods still predominate.

The electric is the car of efficiency, cleanliness and silence, and these qualifications are becoming more and more understood every day. It is far easier to place a new electric in service today than it was a year ago, and it behooves to so arrange our business as to reap the maximu mamount of benefit from this complete conversion of opinion and respect.

As we prepare to handle our own vehicles, it is advisable to provide, not only for our own growth, but also offer to render service in the meanwhile to outside customers in general.

In the larger cities of the country, the modern apartment means essentially a very different condition to be fulfilled from that we are confronted with in smaller cities and towns.

The percentage of families who can provide home garage quarters in cities like Galveston, Houston, Dallas, Fort Worth and Memphis is vastly greater than Chicago, Boston or New York; but the necessary thing is, when an electric needs attention, it should be given while the trouble is yet in its infancy, and procrastination costs money in any event.

In order that this work should be properly executed, is there any more logical place, outside of the factory, than in a garage, owned by a central station, equipped with the best of apparatus and employing efficient help?

This equipment and help is maintained primarily for your own benefit, but the demand upon it is largely at night, since your vehicles are in daily use, therefore is it not good judgment to utilize your organization and allow the electric vehicle business as a whole to profit by such service rendered?

Students of this subject, after investigating the rates and methods of garage operators throughout the country, recommend highly that, where possible in caring for electrics, a separate charge be made for current, for washing and for garaging. If this is done, it is possible to have an equitable and satisfactory schedule of charges, which will promote business to an extent where the garage organization will be able to maintain itself.

In supplying current for charging purposes, it is advisable to make the same charge per kilowatt hour to your vehicle department, as would be made in case the garage was not a part of the organization of the central station company.

Every day we see new proof of the supremacy of the electric, but so long as human intelligence is coupled with its use, just so long will the result be satisfactory. If, through neglect, either from ignorance or intent, we have a service rendered by the electric which is not to our liking, it furnishes additional proof of the theory of cause and effect.

When an individual becomes the owner of an electric pleasure vehicle, or a commercial truck, he has acquired an engineering masterpiece, both from a mechanical as well as an electrical viewpoint, as for its outward appearance, nothing equals the finish and attention to details for the sake of comfort and safety, which the electric receives before it leaves the factory as a finished product. The standard of excellence, which is raised by such perfection carries with it the admonition or imperative demand that reasonable care be exercised in an effort to maintain the vehicle in first-class condition.

The difficulties which arise in the everyday use of electrics are not always of such a nature as will permit of their correction at home by the owner or an inspector. Should the inspector find a mechanical adjustment of brakes or driving mechanism needing attention, we cannot expect him to be equipped to dismantle and reassemble the car in the private home garage.

There must be some place to recommend where we have the assurance that it will be correctly executed, or we fancy the havoc wrought by a machine shop mechanic as he dismembers the driving mechanism of a recent model car. Imagine him as he pounds or otherwise abuses a set of ball bearings worth $35.00. See him as he sets by guess an adjustment we know should be to within one one-thousandth

of an inch. Few cars can long survive the ordeal just pictured.

As a direct result of the mistake made by an incompetent mechanics, I can show you an instance where a coupe was actually given away before it was two years old. This came to our attention after our service station was in operation, and at an expense of less than $50.00 this car was placed on the road, and has performed three years' satisfactory duty since. Needless to state, the present owner feels that the central station was a distinct boon to electric vehicle owners in Memphis.

We had another instance in which a perfectly good new battery was ruined and gave less than fifteen hundred miles, because the mechanic knew more, ostensibly, than the factory. Sure death to anything.

During the first few months after opening the garage, our work tickets will show more gratuitous work than work charged for. Electrics that had been used as chicken roosts were pulled in, patched up and placed in service. The least their owners ever did after that was to trade the old car in to the factory, where they were promptly and properly junked—but the result was a new car and new confidence in electrics and a clean sheet to start with again.

Has it paid? In 1911, when we opened our service station, there were fifty pleasure electrics, many not in use, and eight commercial electric trucks. Today there are one hundred and eighty pleasure cars, *all in use,* and forty-six trucks.

From May 1, 1912, to May 1, 1914, the number of cars in Memphis, both commercial and pleasure, has trebled itself. *That is my answer.*

The total investment of our garage is not quite equal to the investment in electric meters alone, to connect a sufficient number of small residences, which would bring in an equal revenue. During the year 1910 our total current sold for electric vehicle charging was thirty thousand kilowatt hours. We are now using more than that amount each month, the total for 1913 being three hundred and eighty thousand kilowatt hours, and at the present rate of increase wlil pass the half-million mark for 1914, or more than fifteen times that sold in 1910.

We attribute our success to the manner in which we have taken care of the business, and we share that success with the vehicle, battery and accessory manufacturers, as all of them have been clever assistants to us in our work.

Drastic Laws for Cleveland

Safety first ordinances providing for traffic regulations and the use of streets and sidewalks, which went into effect in the city of Cleveland on June 7, contain many drastic features which should cause a reduction of traffic congestion and accidents due to motor vehicles. One section of the new ordinance states that every motor vehicle must be equipped with a red light on the rear and three white lights, two on the front and one on the rear, the rays of which rear light shall illumine the number plate of the vehicle in such a manner that it can be visible at least 200 feet from the rear.

Any vehicle carrying material which projects behind the dimensions of said vehicle shall carry a red light at the extreme end of the projecting material at night.

In another section a motor truck is defined as a motor vehicle with solid tires and constructed to carry freight or merchandise. The speed of motor trucks upon the streets of the city shall not exceed 12 miles per hour in cases where the weight of the vehicle and the load is more than 3 tons and less than 8 tons, and shall not exceed 8 miles per hour in cases where the weight of the vehicle and the load is 8 tons or more.

This section seems faulty in that the definition of motor trucks does not include those equipped with pneumatic tires of which there are a great many.

Another section states that no load in excess of 12 tons weight, including the weight of the vehicle, shall be propelled upon the city streets without special permit from the director of public service.

However, more than 12 tons may be hauled in a train made of a motor vehicle and trailers, provided that the number of vehicles in such train shall not be greater than is sufficient to haul three separate loads and that the weight of each load, including the vehicle, shall not exceed 12 tons. A train of such vehicles must carry a brakeman on the rear vehicle. The speed of a train of vehicles made up of trailers shall not exceed 6 miles per hour.

One-way traffic upon certain specified streets is clearly defined. Another section provides for the issuance of a permit to the owner or occupant of a building facing a street which allows him to mark with white the portion of the curb in front of such building at which no vehicle shall stop except while discharging passengers or merchandise as set forth in the permit.

It shall be the duty of all pedestrians to observe the line of traffic at street intersections and to obey the signal of policemen who are directing the movement of such traffic, and they shall not cross before the signal is given for the traffic to move in the direction towards which the pedestrians are crossing.

Electric Vehicle Movement in England

An electric vehicle movement is being promoted quite enthusiastically in England. It is mentioned that a parade of such vehicles arranged in connection with the Municipal Electrical Convention at Birmingham from June 15 to 20, included cars from five different firms. While this figure represents advance, it also shows how small is the number of firms handling the electric type in England at present. The Electric Vehicle Committee is pursuing its work with enterprise under the direction of Secretary Ayton. One of its latest announcements is to the effect that the accumulator makers have decided in favor of standardizing a plate for electric vehicle batteries having dimensions of eight and five-eighths inches by five and three-quarters inches, with lug centers four and three-eighths inches. Standardization of sizes of cells is also under consideration. Fifty-one municipal electric supply undertakings and three companies have agreed to a rate of one penny per unit or less for "off-peak" charging. As to the position of the plug receptacle on the vehicle it is recommended that this be fixed under the driver's seat preferably with the plug pointing upwards so as to make it impossible for the driver to take his seat without noticing that the charging connection is attached to the vehicle. Serious damage has been caused by a driver starting his vehicle without disconnecting the charging plug.

Somebody said once that the electric vehicle was probably the best automatic corrector of the load factor yet devised; it works while you sleep.

Trucks Crowd Horses

Exact data just made public by Edward Cohen, Chicago city collector, furnishes an interesting comparison of the delivery methods now in use in this city.

All vehicles in Chicago, whether used for pleasure or business, must be licensed. As the city derives a large revenue from this source, comparatively few vehicles escape registration.

The license list completed by Mr. Cohen shows the speed with which motor vehicles are replacing horses as a means of heavy-duty transportation. Since 1911 there has been a decrease of 1,789 in two-horse wagons. During the same period is noted an increase of 3,408 in the number of commercial motor vehicles. Of the latter 2,012 are delivery wagons of less than one-ton capacity, while 1,396 are heavy-duty trucks. In April of this year only seventeen four-horse vehicles were in use in Chicago.

Traffic conditions in Chicago are more favorable for horses than in almost any other city in the United States. Level streets, which for the most part are well paved, make the city easy on horses and as nearly ideal as possible for teaming.

But the speed of horses is limited even under the best conditions. They are affected by other conditions than those of traffic. Extremes of weather affect horses just as they do human beings. On hot summer days horses cannot keep the pace that they set when it is cool. On the other hand, motor vehicles are not affected by weather conditions.

We invariably find that the wide-awake business man who motorizes his delivery system enlarges his scope for doing business and at the same time enlarges his business itself. The man who clings to the old idea that the horse is good enough is finding his territory circumscribed and his business taken away by the motor vehicles of his more modern competitors.

In all lines of business the same principle holds true. You must either be up-to-date or fall behind. The delivery problem is of more importance today than ever before. Customers demand the best delivery service. If they can't get it at one place they will go to another. The man who hitches his business to the traces of his horse delivery wagon is rapidly losing ground.

Electrics Haul Mail

The Postal Transfer Service, Inc., has purchased 20 two-ton General Vehicle wagons, which will be utilized in hauling a portion of the mail on Manhattan Island, New York City.

The company has contracted to haul all the mail between the general postoffice and the branches and the railroad terminals south of Forty-second street, it being divided into three classfications. The "mail-messenger" class entails the haulage of the incoming European mail between the receiving pier and the outgoing railroad terminals, handling all of the mail brought into the city of this class; the "transfer" class is the haulage between the railroad terminals, this requiring trips to Jersey City, and the "station" class is the haulage between the general postoffice and the branch stations. This does not include the collection of mail at the sub-stations or at the plants of individual concerns.

The Postal Transfer Service has established a garage at First avenue and Forty-second street, where the electrics will be stored when not in use. The president of the company is H. Rowley, and J. J. Cassidy is the vice-president and in charge of the operating.

Toronto Has Low-Charging Rate

For electric-vehicle charging service the Toronto (Canada) Electric Light Company, Ltd., tenders a special rate which is designed to encourage larger use of customers' cars by rapidly reducing the equivalent cost as the monthly consumption of kilowatt-hours increases. The Toronto schedule begins with a rate of 5 month's maximum demand, while for the second fifty cents per kw-hr. for the first fifty hours' use of the hours' use the charge is but 1 cent per kw-hr. For all energy consumed beyond 100 hours' use of the maximum demand in any one month the rate is but 0.5 cent per kw-hr. On this basis the average return ranges from $10 to $12 per month per vehicle. At the present time 125 pleasure cars and twenty electric trucks are in use in Toronto.

Applying Motors to Wagons

The problem of applying electricity as a motive power to ordinary wagons has been solved in a rather ingenious manner in France by the use of the "Fram" front truck, says *Popular Mechanics*. It has battery and motor combined in a most compact shape together with the two wheels, and the device can be fitted at once onto an ordinary wagon so as to simply replace the forward truck. A light, sheet iron box mounted on the wheels contains the storage battery and two electric motors which drive the wheels by gearing, so that there is no complicated mechanism. Steering and all operations of handling the wagon become quite easy.

Waverley Braves Mud Road

E. D. Craig, president of the Savannah Electric Garage and Tire Company, Georgia, drove a Waverley Electric limousine carrying four passengers to the barbecue at Springfield recently. The start was made ahead of the party so as to enable them to take photographs of the car en route. The road proved to be in good condition. One hour and thirty-five minutes is the electric record established by the Waverley on the return trip. With a 4,000-pound load to carry over a dirt road this record is remarkable for a car of the electric type. This is the first time that an electric car has been used for a cross-country trip in this section.

German-English Dictionary

C. N. Caspar Company, 454 E. Water street, Milwaukee, Wis., announce a new and valuable technical dictionary of the English and German languages.

The volume comprises the most important words and terms employed in technology, engineering, machinery, chemistry, navigation, shipbuilding, electrotechnics, automobilism, aviation, etc.

This useful edition is divided into Parts I and II. Part I consists of English words and German definitions. Part II gives German words with English definitions. The edition is of much assistance for technical translations. The volume sells for $1.00 net.

The Advantages of the Coastometer

An Investment Which Records Distance Traveled With Power Shut Off

"HOW far will it go?" has long been a leading question in the sale of electric vehicles. The question has always indicated a doubt as to the ability of the storage battery to carry enough energy to complete a day's work. However, an answer that should satisfy even the most obdurate skeptic is to be found in the thousands of electrics that are now in daily operation throughout the country. Indeed, the old question is seldom heard in these days, for another has taken its place.

Users want to know how far the car will go with the power shut off. Hence the coastometer. This, as its name implies, measures the distance coasted. It is something new, and is one of the developments that have followed the refinement of all types of motor trucks.

The coastometer measures not only the distance covered with the power off, but the total length of the trip. A flexible shaft is connected with the wheel, while the mechanism which records the distance traveled as distinguished from that coasted is back of the dial. This mechanism is controlled by electromagnets.

In a test of the coastometer a three-and-one-half-ton truck covered a given route in New York, 20 per cent of the distance being negotiated with the power off. On this trip there was no special attempt made to coast. On another trip, over the same route and under the same conditions, with a special effort being made to economize on current, 30 per cent of the distance was covered with the power off. And while this showed a saving in current, the time of the trip was almost the same as that on which there was a greater current consumption.

The use of the coastometer gives the chauffeur an opportunity to display his skill as a driver—makes him one with the designers and engineers in not only building but operating an electric car to develop its highest efficiency.

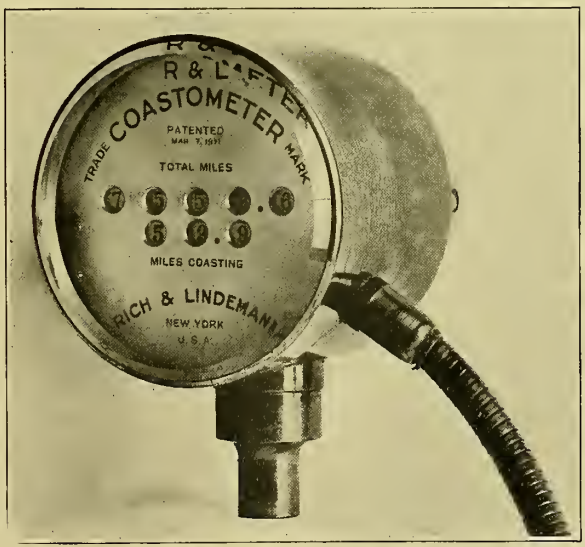
There has been an urgent demand for an instrument which would secure such statistics. Central stations are daily asked for advice in regard to electric vehicle operation, comparatively little has been done to enlighten the public as to what to expect in the matter of mileage and power consumption.

The principal difficulty in carrying on such a campaign of education arises from the fact that the central stations themselves do not know any too much on this subject, and are often at a loss as to what kind of instructions to give. They are consulted with regard to different kinds of vehicles and different kinds of batteries. Scarcely anything can be obtained from the catalogues of the different vehicle manufacturers to enable them to know what advice to offer. The greater number of electric vehicle catalogues make no reference to methods of operating and of taking care of the vehicles or of the amount of power required to operate them, and the purchaser of a vehicle is generally allowed to get information on these subjects as best he can.

Batteries in electric vehicles have not heretofore, as a rule, been given proper consideration. This will readily be admitted by everyone who is familiar with the manner in which they are used. The average mileage per kilowatt hour of current consumption obtained from the pleasure or passenger vehicles in Chicago is in many cases but very little higher than that obtained from a number of one and one-half ton commercial vehicles used for delivering merchandise, although several makes of cars are capable of giving twice this mileage.

The coastometer records the distance the car covers while the power is shut off. The instrument is combined with a standard type odometer. The total distances the car has traveled and that part of this distance over which it has coasted is shown direct in miles. With these two known distances the ratio of miles coasting to total miles traveled gives the percentage of operation without power. The higher this percentage the more efficiently is the driver handling the vehicle.

Engineers and manufacturers for some time past and up to the present time are bending every effort toward producing machinery and equipment which will deliver electric power at the lowest possible cost and the purchaser of electric machinery is constantly demanding in his specifications that he be given the highest efficiency obtainable. In turn the consumers of electric power are using every possible means to lower the existing rates.



The Coastometer Records Coasting Distance.

Why all this strained effort to obtain electric power so economically and in the same hour see it so wastefully expended?

An electric battery car starts out on its day's run with battery fully charged. How will this energy be expended? Will the battery car be worked at the same percentage of efficiency as

was contemplated by the engineer, the manufacturer and the purchaser? The solution of the whole problem depends upon the driver. Up to this point every detail has been worked out by professional and commercial men highly skilled in each branch of their art. It is desired at last to include the driver under this same skillful management.

The object in coasting is at all times to make use of the momentum of the car while it is in motion, traversing the distance without power and to apply the brakes as little as possible.

For example: A 3½-ton electric truck with a constant load, was driven, without any special effort being made to coast, over a certain route in New York City. The coastometer gave a ratio of 20 per cent coasting at the end of this trip. The truck with the same load was again driven over the identical route with special attention being paid to coasting. The coastometer at the end of the second trip recorded a ratio giving 30 per cent coasting. Readings were also taken from an integrating wattmeter which had been installed on the car. The difference in wattmeter readings of battery output at the end of the two trips showed a saving of 11.1 per cent in the second trip over the first. This saving was accomplished by increasing the coasting 50 per cent. There was practically no difference in the time of the two runs, as the average speed in miles per hour agreed very closely.

A list made over an extended period indicated drivers coasting as low as 6 3-10 per cent, while over the same route another driver coasted 32 2-10 per cent, all other conditoins the same at both times.

In order that proper records may be preserved a regular form is filled out each day showing a complete record of the car and the driver's efficiency at a glance.

The New York Exposition

The Eighth Annual Electrical Exposition of New York City will open at the Grand Central Palace October 7 and continue until the 17th. It is estimated that exhibitors this year will have an opportunity to influence a purchasing public of 10,000,000 people, and that any product displayed will be able to make its personal appeal to from thirty to thirty-five thousand people daily. All indications are that the 1914 show will surpass any of its predecessors.

The exposition will include demonstration of the uses of electricity in the various government departments; modern devices for utilizing electric energy on the farm, in the home, store and factory; electric vehicles, both business and pleasure cars; storage batteries, and numerous garage appliances.

Just how much benefit is derived by exhibitors can be well estimated when it is known that last year's exhibits were 50 per cent greater in extent than those of preceding years. The attendance also showed a remarkable increase, all previous records for a single day being broken. The last day of the exposition, Saturday, October 25, in spite of unusually stormy weather, 35,000 were admitted to the building exclusive of those who attended on passes. This is said to be the largest daily attendance in any permanent secular building in the world.

A prominent feature will consist in the electrical automobile exhibit. Every effort is being made to see that this end of the exposition is not slighted. Business and pleasure cars will be given the most prominent setting possible. The inside automobile track, with garaging facilities for exhibition and practical use, will be continued and no expense will be spared to increase public interest in the electric.

The general offices of the show are located at 124 West 42nd street, New York City.

Motor Truck Club Meets

According to the Motor Truck Club bulletin, through the courtesy of the Automobile Club of America the last meeting was held in their general assembly rooms on the evening of une 17, there being present about eighty members. Honorable Robert Adamson, fire commissioner of New York, was to have spoken on "Fire Prevention and Protection in Motor Truck Garages," but due to a misunderstanding of the date of the meeting, was not present.

G. A. Green, chief engineer of the Fifth Avenue Coach Company, had prepared an excellent description of his company's new station, which was read by a club member in the absence of Mr. Green.

Engineer Harold Martin, of H. C. & A. I. Piercy, general trucking contractors, read a paper on "An Ideal Electric Truck Garage, which appears elsewhere in this issue. D. C. Fennee, district manager of the General Vehicle Company, explained in detail a set of repair shop forms and a method of satisfactorily determining repair and overhaul costs which his committee had been working on with the hope of their universal adoption by members of the club and other motor organizations.

Joseph Husson, of the *Commercial Vehicle,* explained a series of fifty lantern slides prepared by the club of leading truck garages of New York City. These slides particularly brought out both good and poor features of construction, equipment, design or maintenance. It was quite apparent from most of the views that truck owners should give the subject of garaging a great deal more consideration than has been the case in the past.

After some discussion of the papers, a report was read covering a proposal on the part of the street cleaning department of New York City, to establish a model street cleaning district, details of which will be found on another page, and a resolution was presented and by vote adopted, as follows:

"That the Motor Truck Club of America heartily advocates and supports the plan proposed by the Hon. J. T. Featherston, commission or street cleaning, for the establishment of a model street cleaning district, and especially endorses the plan in respect to the organization of an expert technical staff to insure the designing, installation and operation of the proposed system and operation of the proposed system, to be carried out along scientific and businesslike lines. That a copy of this resolution be sent to his honor, the mayor of New York City, and to the honorable Borough president of Manhattan.

Before closing the meeting, President Duck read a report of the club's counsel, Ernest K. Coulter, covering the formation of a Legal Aid Bureau to be tried out in New York, and if successful, probably adopted in other cities.

Practically every electric vehicle sold last year meant revenue to the central station; that's an absolute fact. Not only revenue for the time being, but a permanent income.

ELECTRIC VEHICLES

Published Monthly by

ELECTRICITY MAGAZINE CORPORATION

Monadnock Building, Chicago

Telephones: Harrison 3014—Automatic 61028

New York Office, 1022 Longacre Building, 42nd Street and Broadway.

Ed. J. Mock and Paul H. Woodruff, Editors

Fred B. Schafer, Associate Editor.

Allen L. Haase, Advertising Manager

Entered as second-class matter January 22, 1912, at the postoffice at Chicago, Illinois, under act of March 3, 1879.

TERMS OF SUBSCRIPTION

United States, Cuba and Mexico	Per year,	$1.50
Canada	Per year,	1.75
Foreign countries within the Postal Union	Per year,	2.00
Single copy		.15

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office of publication not less than ten days in advance of date of issue. Regular date of issue, the first day of each month. New advertisements will he accepted up to within five days of date of issue, hut proof of such advertisements can not he shown in advance of publication.

NOTICE TO SUBSCRIBERS

Remittances—Remittances should he made by check, New York draft or money order, in favor of Electric Vehicles. Foreign subscriptions may he remitted direct hy International Postal Money Order.

Change of Address—The old address should be given as well as the new, and notice should he received two weeks in advance of the desired change.

This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in Electric Vehicles *or any voice in its management or policy.*

CHICAGO, AUGUST, 1914

TABLE OF CONTENTS

AN ORGANIZATION PURELY ELECTRIC.

IT is quite encouraging to electric vehicle interests in Chicago to note the formation of a society devoted exclusively to developing electric garages—and electric only.

Chicago for some time has been one of the greatest electric vehicle centers of the United States, yet in spite of the success which has been deservedly secured by energetic sales campaigns the electric selling element has been obliged, or at least has allowed itself to come under the law of a garage organization which by its constitution and its actual efforts of development has signified but one desire—to reach a climax in development of gasoline garage enterprises.

This older society, although originally instigated by "bright lights" in electric vehicle spheres, slowly but surely fell under the power of the more popular selling type, the gas car, until it has reached such a point that electric vehicle interests were obliged to accept the smaller end of the benefits derived—in fact, an unequal voice in the rulings of the organization—and all at the same price paid by the gas car people.

Electric vehicle interests without a doubt have found the gas car an impediment to popular advance in spite of the difference in conditions and characteristics of the two cars. Consequently the two fields, especially the pleasure car selling fields, have met on a competitive basis. Since the stronger element exists in the gas car membership, it is hardly a wonder that electric vehicle manufacturers should expect other than a competitive relation.

The new organization places the electric garage owner on an equal footing with his competitive garage owner catering to the same type vehicle. It presents to such owners and members an opportunity to receive a hundred per cent benefit in advancing the "electrically propelled way." Members are not obliged to listen to discussions on the hight test point of gasoline nor the advantage of four or six cylinders. This society discusses only those subjects which are of vital interest to electric vehicles.

The new organization at first thought might be considered as detrimental in that many garages cater both to gas and electric types. To these owners a membership in both organizations is practically indispensable, for each society will discuss in detail the two types respectively, thereby allowing the joint member a better advantage in both industries.

Electric vehicle owners, accessory men and garage owners should rally to this new society at once; boost it and from their membership make a splendid representative of this fastly developing industry.

EFFECTS OF THE WAR.

SO FAR as electric vehicles are concerned Europe and America have little in common. Of all countries of the Eastern Hemisphere, England alone has made any decided progress in the development of a battery-propelled vehicle industry. A few are in use in Germany and France, but none of them are either exporting to, or importing from, the United States to any extent worth mentioning. The electric vehicle business is a home industry with us.

The European war, therefore, will have very little effect upon the actual market for electric vehicles. How it may influence the manufacturing processes of American cars is another question. Among the parts which are imported to a considerable extent, either

finished or raw, may be mentioned tires, worm gears, ball bearings and some storage batteries. It is quite evident that the imports of storage batteries for vehicles are not of vital importance because of the vast output and capacity of American battery plants. The matter of tires may offer something of a problem before the war is over.

Imported worm gears have been recently adopted by a number of electric car builders, and these parts are apt to become quite scarce while the war lasts. But it is entirely possible to make worm gears in this country, and there is no reason why a shortage of the imported variety should work any serious harm to the trade.

The ball-bearing situation might be more serious if it were not, fortunately, in the hands of alert and resourceful importing agents. One of these companies has offered a suggestion to its trade which, if agreed to, should help to relieve any possible stringency through the co-operation of all those involved in the importation of ball bearings. Here is the suggestion as offered by the importer mentioned:

In view of the present unsettled conditions in Europe and the uncertain ability of importers to replenish their stocks, we offer the suggestion that all of the importers of ball bearings shall, during this trouble, co-operate with each other and shall enter into an arrangement together whereby any importer can call upon another for such bearings as he may require for urgent delivery to his customers and whereby such call shall be answered, if possible and stocks permit, with the bearings required. We ourselves at this time hold a heavy stock of our usual numbers which we will gladly throw open, as far as possible, to importers.

This suggestion is offered to overcome the nervous, and possibly later on hysterical, condition of the market in reference to the ability of importers to deliver and to uphold such of the importers as may not hold the stocks required at this time to carry their customers along.

We take the view that the importers of ball bearings should stand together in this crisis and should show the trade that we are ready not only to help each other, but are ready to assist the buyers of imported bearings by enabling them, through their regular channels of supply, to obtain imported bearings.

While this action cannot actually increase the stock of bearings in this country, it will certainly afford a more even distribution of what stock is obtainable, and so avoid those "areas of low pressure" which might give rise to fear and trouble.

Taken all in all, the electric vehicle business is probably as little affected as any American industry by the European war. An ordinary amount of resourcefulness and enterprise and the substitution of American-made for European-made parts will overcome even the minor inconveniences of the occasion.

New Route for New York

New routes in New York have been adopted for automobiles carrying United States mail to facilitate speed, vehicular traffic and safety.

The change came about following the tour of inspection and conferences among police officials, representatives of the Postal Transfer Service Company and officers of the Safety First Society.

J. M. Mansten, general superintendent of the transfer company, has instructed drivers of mail automobiles to use the following streets in future:

From the General Post Office to the Grand Central Post Office, east on East Forty-second street from Fourth avenue, then north on Lexington avenue to Forty-fifth street, and west to the Grand Central Post Office.

Between the Pennsylvania station, some of the ferries and sub-stations, in Eighth avenue to Forty-fifth street, east to the Grand Central Post Office.

The new routes eliminate the operation of the mail automobiles in Forty-second street and Vanderbilt avenue, which greatly relieves congestion in both of these thoroughfares, and especially at the intersection of Madison avenue and Forty-second street.

Thomas Myers, inspector of the Traffic and Marine division of the police department, has issued orders creating new posts at Madison avenue and Forty-firth street, Fifth avenue and Forty-fifth street and Broadway and Forty-fifth street, where men are stationed to facilitate the handling of traffic and to expedite the movement of United States mail automobiles.

The committee on street traffic of the Safety First Society has recommended that the stand for public taxicabs in Vanderbilt avenue, opposite the entrance to the Grand Central Terminal, be eliminated; also that Vanderbilt avenue be given over to the movement of northbound vehicular traffic only, which would reduce to a minimum the possibility of accidents at this point.

Trucks for Transporting Cotton

For transporting bales of cotton between the Moody compress and the steamship piers at Galveston, Tex., distances varying from 0.5 mile to 4 miles, use is made of three special six-ton electric trucks, equipped with pack saddles which enable one truck to carry about 30 compressed bales of cotton. Although the trucks are rated at only six tons, they are commonly used to transport loads as high as 18,000 pounds. In this way, at the present time, about 200 bales varying from 550 pounds to 600 pounds in weight, are being transported daily between the cotton compress and the docks.

German Tire Statisties

According to statistics supplied the Department of Commerce by one of its European consuls, in 1911 there were 18 factories engaged in the manufacture of tires for motor vehicles, these employing 310 persons. The paid salaries totalled $2,889,320. The division of tires shows pneumatic manufactured to the value of $16,860,396, and solid tires to the value of $4,312,084. Bicycle tires to the value of $10,987,032 were manufactured. The majority of tires used on German motor vehicles are of German manufacture, although some French makes are becoming popular.

Motor Truck Club Forms at Los Angeles

At a meeting of the Motor Truck club held recently at the Menominee Truck agency on South Olive street, Los Angeles, California, it was decided to organize a Motor Truck Dealers' association, with aims in the motor truck field similar to those of the Motor Car Dealers' association in the pleasure car field. An earnest effort will be made to have every truck dealer in Los Angeles join the association.

Cantilever Spring for Flexibility

An automobile spring pivoted to the frame at the center and shackled at the front end is clipped to the axle at the rear end. This gives true cantilever support and affords a high degree of flexibility, when the spring itself is an inverted semielliptic one. This form of support lends itself to the use of a shock absorber.

Uses and Abuses of Service

Service from the Standpoint of the Maker, the Dealer and the Truck User

THE Motor Truck Club of America on July 15 discussed the subject of service, its uses and abuses. The paper read took up the subject from three phases—from the viewpoint of the manufacturer, dealer and truck user. W. L. Day, general manager of the General Motors Truck Company, presented a paper, which follows:

We are all agreed, no doubt, that no business enterprise depending on the public for support can long exist without service. We are also, no doubt, all agreed that in the motor truck field the buyers of trucks have been led to expect too much free service.

This condition has been brought about because, in the keen competition between so many manufacturers, the overzealous salesmen vied with each other in promising service until *the average buyer if promised good service, expected to have his truck chaperoned day and night, a mechanician at his call at all times to repair any breakage, free of charge, regardless of how it occurred.*

We all know, whether willing to admit it or not, that the word Service in connection with the sale of motor trucks has been very much abused.

In our desire to keep all of the other two hundred competitors out of the field we all tried to make good the foolish promises of our salesmen, and the watchword seemed to be "Get the business—hang the profits." Such extravagant practices have made the motor truck business unprofitable in spite of the fact that the public has insisted that motor trucks cost too much money.

The selling of motor trucks is a merchandising problem not unlike the selling of any other equipment. If this be true, why shouldn't they be sold on the same basis and the same kind of service be furnished the customer?

When we want to make a quick trip between Chicago and New York we want good service—we want fast time and a train equipped with all of the conveniences of travel. We take the Twentieth Century and pay a nice premium over what it would cost us to go on the slow train.

The railroad company says: "Take this train and we will give you the best service on wheels—but you must pay us for it." When we arrive we want the best hotel service—and we pay for it.

We demand good service from whomsoever we buy anything; but we all know that *although we may get the service, we are paying for it;* unless, perchance, we buy a motor truck, and then we expect the factory and sales forces to give us their service gratis.

Trucks as made today by any of the reliable manufacturers are out of the experimental stage, and their worth has been established.

A good motor truck adapted to the service for which it is bought will make money for its owner if it is properly handled.

When a man buys a heating plant for his building he buys one that he is convinced will answer his purpose. He pays a certain amount for having it installed in his building, and the manufacturer warrants the material and guarantees it to perform a certain service if operated according to instructions.

If it proves to have a defective part the manufacturer makes it good. If, however, the janitor undertakes to start the fire with gasoline and blows up the furnace the owner does not expect the manufacturer to furnish the repairs free or arrange to heat the building for the owner while repairs are being made.

In the selling of motor trucks *the first service to a prospective customer should be a pre-sale service.* The customer's transportation problem should be thoroughly and competently analyzed. It should be determined whether the prospect can use trucks advantageously in his business. If he can, he should be advised as to the kind and size best adapted to his service.

The salesman whose desire for an order leads him to persuade the customer to make a wrong installation, to buy an electric when a gasoline truck would serve him better, or to buy two 1-ton trucks when one 2-ton truck would do his work, not only injures the business of his own company, but damages the truck business in general.

Having advised the right installation and secured the order, the next service is for the manufacturer to see to it that the customer gets the truck when it is promised and that it goes to him in perfect working condition. The driver should be made familiar with the operation of the truck; thoroughly instructed regarding the danger of overloading and overspeeding.

The warranty, of course, guarantees the truck against defective material and workmanship for a stated pediod. From this point the customer should be made to understand that the truck is his property and that he assumes the responsibility of its future care and management.

If a part should prove to be defective the manufacturer should promptly supply a new part free of charge according to his warranty.

It is the duty of the manufacturer to make provision for prompt service in the way of repair parts, to provide the customer with an illustrated parts list, so parts can be ordered intelligently, but if a part is broken through the carelessness or recklessness of the driver, while the customer should be able to get the repairs promptly, he should pay the expenses of making the repairs.

THE OWNER'S RESPONSIBILITY.

Having served the customer faithfully and well in the points mentioned, we believe that constitutes all the service that should be guaranteed a purchaser of a motor truck of known reputation.

There are, of course, numerous ways in which the factory representative or the dealer can be of service to the purchaser. That somewhat intangible or indefinite, but nevertheless valuable service—cooperation with the owner; the offering of suggestions and advice will assist the owner to get the best and most profitable service out of his truck.

Such things help to make a satisfied customer, one of the best assets any of us can have.

We do not believe that in any line of business in which the public is served a hard and fast rule can be laid down as to just what service should be given and what withheld, except that we do believe that it is wrong to lead a purchaser of a truck to believe that he will virtually be relieved of all responsibility of properly maintaining his truck, and that is what too many of us were guilty of doing in the earlier days of truck development.

There may be a temporary advertising value in promising a customer *what virtually amounts to a perpetual chaperoning of the truck;* with a skilled mechanic at call day or night, or an extra service truck to be had on demand in case of a breakdown, but it can be only temporary, for such promises cannot be lived up to if much business is secured, and here also the reaction is detrimental not only to the individual manufacturer but to the entire trade.

The more the purchaser of a truck assumes the responsibility of its care, the better satisfaction he will get out of his purchase and the better booster he will be for the manufacturer whose truck he uses and for the use of trucks in general.

"It is better that thou shouldst not vow than that thou shouldst vow and not pay" says the Good Book, and we believe that it is better to promise only that which business justice and business reason dictates.

If the case justifies additional service by reason of peculiar circumstances the customer will be better satisfied than if too much is promised and then grudgingly fulfilled or not at all.

J. W. Perry's paper on the subject, As the Dealer Sees It, follows in part:

AS THE DEALER SEES IT.

This much-mooted question has been the cause of much ill-feeling between dealer and manufacturer and dealer and customer. Much of it has arisen from the dealer's desire to effect a sale and in this endeavor he is at times prone to offer too much to the customer, especially to a first customer, or a man who has never used a motor truck.

After a hard siege and meeting the usual fair and unfair competition, all of which have placed the prospect in a frame of mind where he himself scarcely knows what he wants, the dealer, sometimes, in his enthusiasm, promises more than he should, hoping that he may never be called upon to make good, or, if he should be called upon, to placate or stall the purchaser with some plausible story.

It happens, however, that some purchasers are wise enough to have a very thorough understanding with the dealer before signing the contract and in that event the dealer must make good, and here is where he falls back on the factory for help. In such cases the dealer is not entitled to help, and should be left to reap the reward of his own indiscretion.

To remedy or prevent any such condition, *there should be a very thorough understanding between buyer and seller as to what he is entitled to and what he may expect,* and this understanding incorporated in his purchase contract, as far as possible.

Experience shows that each car sold requires a certain amount of supervision and tuning up for the first few months or year, which is generally furnished in the interests of the industry and the particular car just sold. *There is a danger of sinning on the wrong side and giving too much supervision,* which eventually leads the customer to think that the car is not as good as it should be or leave him under the impression that the dealer will make good anything that goes wrong, whether such wrong is due to faulty construction or to careless handling.

Under any condition, the purchaser is entitled to prompt service, and this should be given him, and *he should be made to pay for any damage due to his negligence or misuse.* There are times, however, when matters come up for adjustment where such a claim is quite debatable.

A superficial examination of the complaints of users leads us back to the source of most of the trouble, and this is caused by the manufacturer himself. He, the manufacturer, in his endeavor to place agencies and incidently securing orders for demonstrators from such agents is likely to look up the financial standing of such agent rather than his integrity.

He figures that every agent secured means two or three cars sold, and a volume of business seems more important to some of them than the selection of able and competent representation. Under these conditions we find many agents who, in their endeavor to make sales, by any or all means, will promise more than they should. The manufacturer sits back and smiles, for the more sales made the better for him, as he sells to the agent for cash and ships against a bill of lading.

Members of the board of trade give a 90-day guarantee only, because the agency must give one year, if he is to meet competition. When the 90 days expire and claim is afterward made, the manufacturer calmly points to his guarantee and says, "Nothing doing." The agent then must necessarily make good to his client, and in this way large inroads are made in his profits.

The remedy should be that a manufacturer should seek, for agents, men who understand the motor truck business and who are known to be fair and honest *first* and financially capable *next.* When such an agency has been placed the manufacturer should back him up to the limit, otherwise the reputation of his product will suffer in the end.

When a customer has trouble with his car on the road and calls for help, a mechanic should be sent out with the trouble car and an examination made. If the trouble is due to fault of user or his driver, a charge should be made for such labor and material as are furnished. If trouble is due to defective workmanship or material, such parts furnished should be without charge. The labor of putting such part in place should also be without charge to the customer. This is on the principle established in other lines. For instance, if you buy a watch of a jeweler, a guarantee usually accompanies it. If a main-spring breaks or anything else goes wrong with it, the jeweler does not hand you a main-spring and tell you to put it in yourself, but he completes the job without charge. If you buy a piano it is kept in tune and looked after for a year free of charge. If you acquire a parcel of realty under warranty deed and a defect in title manifests itself later, you go right back to the warrantor and recover—if he is solvent.

All Defects Made Good—My intention is to show that a defective part should be furnished free of charge and labor of putting same in place should also be free to the customer. Now comes the interesting question of who is to pay for all this? The manufacturer, unquestionably. If he makes all his parts in his own factory, the return of the defective part to him

is of value insomuch as it shows him wherein he is at fault and enables him to remedy the evil in his future production. If the defect is in the material he has recourse on the producer of the raw material. On the other hand, if the so-called manufacturer is an assembler only, he loses nothing, and recovers fully from the house furnishing the parts.

So the loss in full replacement of parts is frequently an asset in assisting the manufacturer to determine where parts are weak, and such discovery is not always possible in the usual factory pre-sale road test. The labor of putting such parts in place for the user should also be charged to the manufacturer. The agency did not build the truck, nor are they supposed to be mechanics, although most of them maintain repair shops. They sell the trucks as agents and endorse the guarantee of the manufacturer. The purchaser knows the agent only; in many cases does not even know where the truck is built. The purchaser then holds the agent responsible and he must make good. Attention to the customer as outlined above constitutes, in my mind, good service. Anything short of this is not service.

The agent's duty is to sell trucks and see that they give satisfaction, and this he can only do with the co-operation of the factory. The more trucks he sells, with good service, the more the reputation of that particular make will be advanced. This is important to the manufacturer, for if he changes his agency the successor may inherit the evil reputation created by his predecessor and it will require some time to overcome this.

To sum up, I still maintain that if manufacturers used more discrimination in their selection of agencies, and when they had found the right one, to back his judgment, there would be more sales made and a better feeling created between all concerned. As matters now exist, there must be a goat and *he* is the agent.

The anonymous paper of an owner was next read. While many of the abuses which are related are practiced, it was felt that too much stress was laid upon them, and that too great a tendency was shown toward applying generally to the motor truck trade what is peculiar to a few, and largely outgrown. It follows:

ONE OWNER'S WOES.

This subject of service I consider one of the most important if not the most important one confronting every one engaged or interested in the commercial motor vehicle industry, whether he be manufacturer, dealer or user. But in consenting to prepare a paper on this subject, I wished it to be distinctly understood that my name as a user of motor trucks be eliminated as may be apparent toward the end of this article and for reasons that I am frank to state, would not be tolerated for any length of time in any other line of business than that of the motor truck.

I happen to be one of the first prospects visited by the truck salesmen in this city and while I am a large user of power vehicles, this is due to the extensive reputation of my company rather than the number of machines we may be able to use in the end. Our first visit from a truck salesman must have been about the year 1904, and while I should have remembered his name—for at that time New York was not blessed, or afflicted, I might better say, with the eighty-one companies the club informs me are established here at this time—I cannot recall the gentleman. I do know that the sales force of that year seemed to consist of David C. Fenner and R. T. Allcutt of the Knox, and while they did not dwell to any great extent upon service, for such a thing was unknown at that time, they nevertheless excited my curiosity and continued to do so till about the year 1906, when my company invested in its first motor truck.

During the period, which might reasonably be called the Glacial Age, from 1902 to 1908, the subject of service was not much of a factor in the sales arrangement. We, and by this term I mean the proposed victims, as we were to a large extent, were largely influenced in our purchases by the history of the wonderful performance of a few runs or the inflated descriptions of the factory building the machines. Service was an unknown quantity. Probably the dealer or branch manager knew too much about the midnight oil being burnt to put the truck in condition to stagger through its work the following day, to talk about service. I know very well if anyone had advanced the arguments about service then that they have of late years, my company would have never invested in its first vehicle.

As I recall, about the year 1908 started the subject of service in connection with the purchase of motor trucks. None of us had a very good understanding as to what was intended, but it sounded reasonable and attractive. We were led to believe, as we still are by many of the sales representatives of motor truck concerns of this city, that once we had placed our order all would be taken care of, and it certainly made an impression. It still does among those who are investing in their first, who are not carrying on the necessary investigation to determine whether they are dealing with a fly-by-night agency or a substantial concern. It may be taken as a regular and infallible rule that the companies who talk the most about service today in New York are the ones who have the least intention of giving it, or are able to give it if the intention were there.

The subject of service has become such a pest that I am often inclined to immediately order out of my office the salesman of a motor truck who starts to make the matter one of the important items of his conversation. I know as well as most of those who have used motor trucks for any length of time that the manufacturers or agents cannot give what they claim to be able to give and last any length of time; failure must result and does result as may be apparent from an investigation of the truck business of this city.

I am perfectly aware from my past experience that the manufacturer and the agent must charge the prices for trucks that they do today if they are to in any way furnish what they agree to, but in the majority of cases do not when the proper time comes. From a business point of view, it would be far better to all concerned if the manufacturer would make his price contingent upon a proper determination of cost with a reasonable margin of profit and place the responsibility of the operation of the vehicle up to the owner. Of course, this is not to be advocated just so long as the manufacturer and the agent continue the present prices for their vehicles which is far above what is reasonable, and just so long as they continue with their present policy, *we as users are fools if we do not work them to the limit for free demonstrations, free replacement of parts, overhauls, adjustments, and, in fact,*

every way that lies within our power, it is our fault as purchasing agents.

I am of the opinion that there will be a time not far distant when the truck manufacturer will be willing to market his vehicle at a figure well within reason, but the present price, which, to my mind, includes so many items we as purchasers might better assume ourselves, necessitates our working the manufacturer and agent as good things and suckers as long as they are willing to stand the gaff.

Demonstrations have been run to the ground except to the newcomer in this territory of which there are enough to provide free haulage for an unlimited amount of time and the free service propositions offered are well worthy of consideration in connection with such dealers as their terms of contract or sale can be so twisted by the informed buyer as to leave every obligation on the part of the seller and none on the purchaser. While I do not exactly advocate the elimination of service as practiced in the past, unless the market value of machines is reduced proportionately, for I expect to continue to play the dealer and manufacturer as a good thing, I would like to see a reduction of price entirely eliminating the so-called service and placing the matter up to the purchaser as is the case with nearly every form of machinery now being marketed.

Boston's Ideal Charging Station

Personal attention, backed by more than a decade of experience in the electric vehicle industry, is the foundation of the success of the D. C. Tiffany Company of Boston. Mr. Tiffany supervises every department of his establishment, and the satisfaction of the company's customers is due to the fact that "big chief" made the final inspection and they know the work has been done correctly.

An Ohio Service Car Maintained by the Garage.

Located at 136 Chestnut street, in the heart of the Back Bay, which is to Boston what Fifth avenue and Riverside Drive are to New York, the garage, exclusively electric, occupies a three-story building. Convenient to the business section as well as to the residential district, many electric trucks make the garage their headquarters.

On the street floor is located the office and the salesroom, for the Tiffany Company is agent for the Ohio Electric and shows a large line of the different models. In the rear of the salesroom is the washroom, together with several charging stations.

The second floor is given over to storage and a well-equipped stock and parts room. On the upper floor are located the battery room, the machine shop and more storage space. In all more than 18,000 square feet of floor space is devoted to the business and already plans are being drawn for a much larger plant.

The electrical equipment consists of 36 charging stations situated on the different floors, the garage being in the direct current district of the Boston Edison Company. A peculiarly complete set of charging records is maintained at the garage, copies being furnished to all customers.

The company maintains three work cars, two being used for general work, such as tow-ins in case of accident, tire deliveries, etc., while the third is of special design, carrying a complete wrecking outfit as well as a large storage space for tools, tires, extra parts and similar needs. It is of 1,000-pound capacity.

Mr. Tiffany entered the electric vehicle industry in its infancy and is an acknowledged expert, particularly on battery work. He believes that true satisfaction follows personal supervision of all work and straightforward dealing with all customers from the transient seeking a "boost" to the firm garaging a dozen cars.

A prominent member of the New England Section, Electric Vehicle Association of America, and of the Electric Motor Car Club of Boston, Mr. Tiffany takes an active part in the exploitation of the electric vehicle, and is always ready to give both time and money to the furtherance of the industry as a whole.

Electric Auto Stations

Evidence of the growing popularity of the electric motor cars is furnished by the news of the establishthe vicinity of New York City. The one most remote is in Pittsfield, Mass., which is 172 miles distant. At at some of them garages may be found where required all of them the recharging can be promptly done, and ment of a hundred and eighty recharging stations in repairs can be made or deficiencies of machinery be remedied.

A list of the stations with cost of recharging furnished by the Electric Vehcile Association, as well as a map showing the location of each, has been sent to each owner of an electric vehicle in that city, and can be secured by all others on request forwarded to the Association's office at No. 124 West Forty-second street.

This new venture will be hailed by all owners of motor vehicles that are moved by electricity, as it has long been a question of great consequence to them that the places for securing a recharge when the current carried was exhausted were few and far between, a fact which has driven many to the use of the gas car.

Designs have been accepted and a full-sized model made of an electric motor bus, to run on the streets of New York not covered by street-car lines. The body is of the semiconvertible type, with comfortable seats. Storage batteries give light, heat and power. The car is a "pay-as-you-enter" style, and it is proposed to have young women in uniform to take up the nickels, for the motor-bus line is to be operated on a five-cent basis. Routes are proposed through residence districts, where the noise and dirt of street-car traffic would be objectionable.

Workmen's Compensation and Employers' Liability

Address Delivered Before the Motor Truck Club of America

BY EDSON S. LOTT

MOST foreign countries and more than a score of the commonwealths of the United States have enacted workmen's compensation laws. Many more states will soon enact such laws. These laws are intended to take the place, so far as may be possible, of employers' liability laws.

Lawyers and lawmakers, employes and employers, politicians and "plain people," all with the possible exception of the employers of farm laborers and of domestic servants (and they ought not to stand out), agree that "the industry" should bear the burden of broken soulful machinery as well as the burden of broken soulless machinery; all agree that civilization everywhere has outgrown a system which causes seven workmen out of each eight receiving accidental disabling bodily injuries to bear all the consequences thereof themselves.

EMPLOYERS' LIABILITY LAWS DEFINED.

What is meant by "employers' liability" laws?

Such laws are a combination of common law (judges' decisions) and statutory law (legislative enactments).

Such laws provide that when a workman receives an accidental bodily injury caused solely by the fault or negligence of his employer or his employer's representative, the employer must pay such injured workman "damages," the amount thereof depending theoretically upon the damage the workman has sustained, but actually upon one or more of several things, such as:

1. The generosity (and the ability to be generous) of his employer.
2. The skill and resourcefulness of his lawyer, if he employs one.
3. The attitude of the judge and the sympathy of the jury, if he goes to court.
4. His own cleverness in placing upon his employer the blame for the accident.
5. The alertness and diligence of the employer in gathering evidence to prove that the blame for the accident can not be placed on him (the employer).

Employers' liability laws are so complex and the statements of the witnesses of the accident frequently are so conflicting that it is often impossible to decide in advance of a court trial whether the employer is legally liable to his workman for the damage he has sustained by reason of an accidental bodily injury.

In a great majority of cases the employer is not *legally* liable.

The records show that during the past several years employers have paid, on an average, damages to one injured workman only out of each seven or eight of the hundreds of thousands who have been hurt. And probably not even one in eight was entitled by law (employers' liability law), to damages; that is, probably not one accident in eight is caused solely by the negligence of the employer. (The broadening of employers' liability laws through legislative enactments and judges' decisions as well as the tendency of juries to be more liberal in awarding damages to injured workmen, brought about by the country-wide agitation for workmen's compensation laws, are constantly increasing the number of court verdicts against employers and also are constantly increasing the amounts paid to injured employes in those cases where the employer is not sued.)

WORKMEN'S COMPENSATION LAWS DEFINED.

What is meant by "workmen's compensation" laws?

That every workman who sustains an accidental bodily injury in the course of his employment shall receive "compensation" from his employer; usually medical, surgical and hospital treatment and medicine during the first few weeks and one-half wages thereafter while disabled, subject to some limitations; in case of death the employer must pay to the workman's "dependents" compensation equalling, usually, one-half wages for a certain period of time.

There are many modifications of the outline stated.

Frequently there is a minimum and a maximum amount of compensation payable.

But all workmen's compensation laws the world over set aside the question of who is at fault for the accident, unless it is caused by the wilful (or like) act of the employer, when he must pay an extra amount of compensation, or unless it is caused by the willful (or like) act of the workman, when he is barred from any compensation, under some statutes.

EFFECT OF WORKMEN'S COMPENSATION LAWS.

The effect of workmen's compensation laws is to cause employers to pay something (either for doctors' bills or for "compensation," or for both), every time a workman is hurt; whereas under employers' liability laws the employer pays, on an average, "damages" to one out of each eight workmen injured and nothing at all (except the cost of litigation) in seven out of each eight such cases.

Moreover, the employer must pay, on an average, a larger amount to each injured workman under a workmen's compensation law than he has to pay to one out of each eight injured workmen under employers' liability laws. (But this will not long be so, because of the tendency to increase the awards for "damages." Failure to recognize this fact would soon force insurance companies into bankruptcy).

Liability insurance companies issue policies whereby they assume the liability of employers for accidents to their employes.

The average payment to employes per notice of injury received by insurance companies is steadily growing in size, but the cost for medical attention alone under workmen's compensation laws will average a large part of the total amount now paid under employers' liability laws. In France the workmen's compensation law is known as the "doctor's graft" law.

From the above it is easy to see that insurance premium rates must be many times more for workmen's compensation coverage than for employers' liability coverage of a few years ago.

Under workmen's compensation laws injured workmen will receive a larger percentage of the insurance premiums paid by their employers than is the case under employers' liability laws, for under certain conditions some items of expense of insurance companies will be smaller under workmen's compensation

*President of the United States Casualty Company.

laws than under employers' liability laws. Moreover, injured workmen will not so frequently be obliged to give lawyers one-half the amount they receive—it will not so frequently be necessary for them to employ lawyers—their rights will be far more easily ascertainable. Workmen's compensation laws will be largely automatic.

COVERAGE OF EMPLOYERS' LIABILITY INSURANCE.

Employers, as a whole, buy employers' liability insurance to cover only their legal liability—absolutely nothing more. The insurance they are willing to pay for does not go beyond the liability imposed by law upon the employer, and such liability does not have anything to do with the pain and poverty of the injured workman nor with the suffering and distress of his family unless negligence of the employer is first proved. The employers' liability law says that, no matter how severe an accidental bodily injury to a workman may be, no matter how worthy and needy the injured workman may be, no matter how many may be dependent upon him for their existence, the employer shall not be called upon to pay damages unless the accident was caused solely by the fault or negligence of the employer.

Insurance companies have sold and still sell policies which pay the doctor's bills and wages of injured workmen, while they are laid up, irrespective of who was at fault for the accident, but only a very few employers will pay the necessarily high price for such policies; indeed, only a very few can afford to pay the price—unless all do, otherwise the more humane employer would be at a disadvantage with his less liberal competitor. (In actual practice insurance companies pay thousands of claims of injured workmen each year when there is no legal liability on the part of their employers. This is done by reason of a combination of business and humanitarian reasons. When an employer is in direct litigation with his workman, he is often governed by strong prejudice and passion; that is, he feels keenly a personal injustice. Insurance companies deal with such things impersonally, calmly and dispassionately).

THEORIES OF THE OLD AND OF THE NEW LAWS.

The theory of employers' liability laws is that the employer is not his workman's keeper; that if the workman gets accidentally hurt through no fault of the employer, then there is no more reason why the employer should take care of him and his family while he is laid up than there is why anyone else should do so; that is, that because one gives another man employment he (the employer) should not be expected to take care of the employe while he is laid up from an accident, unless the accident was caused by the fault of the employer.

The theory of workmen's compensation laws is that (eliminating fraud) every industrial worker and his dependents are entitled to "compensation" for every disabling accidental bodily injury sustained by the worker in the course of his employment, without question as to how the accident happened or who was at fault for it; and that the cost of such compensation shall be charged up to the industry (the same as coal consumed and machinery broken and worn out), and passed along to the consumer—the public.

It is said that the workmen's compensation principle begins where the employers' liability doctrine ends.

The activity of reformers, the demand of labor, the knowledge of employers, the belief of the multitude, the expedience of legislators, as well as the broad humanitarian principle involved, are combining to bring about the enactment of workmen's compensation laws everywhere.

DANGER OF HASTY LEGISLATION.

I am in favor of workmen's compensation laws as distinguished from employers' liability laws.

But I am greatly concerned lest lawmakers, through their desire to do justice to employes, do injustice to employers, which will finally react on the employes. Only a few realize the far-reaching consequences of drastic workmen's compensation laws. Employers should not oppose all workmen's compensation laws. Such a course is likely to end in the enactment of ill-advised laws. Employers should foster the enactment of reasonable workmen's compensation laws.

Of course, this suggestion is lost on those of you who are doing business in the State of New York, inasmuch as your opportunity to help shape a law which will be just to the workman without being unjust to the employer is gone. Henceforth you will operate under the most drastic workmen's compensation law in the world. Indeed, I regard the New York Workmen's Compensation Law as the most momentous, the most far-reaching legislation enacted by this state in many a long year.

While this legislation was pending you either sat indifferent, else you idly kicked against *any* workmen's compensation law, both foolish positions.

A question frequently asked by an employer is: "What will be my insurance rate under a workmen's compensation law?"

The only answer is: "It depends upon the provisions of the law."

If a builder is asked: "How much will you charge to build a house," he must necessarily reply: "It depends upon the plans and specifications."

In every state where a workman's compensation law has been passed, employers think that the insurance rates are too high. Indeed, the average employer (wherever located), thinks his employers' liability insurance rate is too high, just as the buyers of your product think that your prices are too high.

INSURANCE PREMIUMS AND LOSSES.

Let us reason together about the rates for employers' liability and for workmen's compensation insurance.

In an effort to keep up with the increasing liability of employers, the rates for employers' liability insurance have been largely increased from time to time, each increase being resisted by employers, even though no general increase has been sufficient to save the insurance companies from an ultimate underwriting loss. There will be still greater resistance on the part of employers as respects rates for workmen's compensation coverage, even though it is evident that workmen's compensation laws will call for larger payments to injured workmen and their dependents than the old employers' liability laws.

Employers have sometimes taken the total premiums received by some liability insurance company during a given year, placed by the side thereof the losses actually paid during the same year, and called the difference "profit."

This is the usual method of ill-advised social reformers when claiming that the whole operation of insurance companies constitutes an "economic waste," and it is the bait used by dishonest promoters of a new insurance company when selling its stock.

Mr. Arno Dosch has said, in *Everybody's Magazine*:

The ten largest (liability insurance) companies collected $23,523,585 in premiums during the years 1906, 1907 and 1908, but paid to injured workmen and their widows only $8,559,795, a little over one-third. In other words, injured wirkmen received, on the whole, one-third of what they would have received if their employers had distributed among them premiums paid to the insurance companies. The rest went to pay dividends, lawyers' fees, salaries of the wily claims agents and "expenses."

The claims paid during the years mentioned by Mr. Dosch do not by any means measure the insurance companies' losses arising from accidents happening during those years. The insurance companies are still paying claims arising from accidents happening during those years. The claims Mr. Dosch mentions as having been paid in the years cited did not (except in a minority of cases), arise from accidents happening in those same years, but instead from accidents happening in former years.

LOSSES LONG DEFERRED.

In life insurance the liability of the insurance company is fixed when the insured dies. The liability of the fire insurance company is known as soon as the fire occurs and the value of the property burned or damaged is ascertained. It is far different in employers' liability insurance, where practically all losses are (from their nature) deferred and indefinite. Sometimes the loss is not ascertainable until ten, fifteen or twenty years after the accident occurs. If an accident happens while the policy is in force, and the company is notified, then the company must pay the loss whenever it matures.

Sometimes a workman sustains a trifling accidental bodily injury and without inconvenience keeps right at work for the same employer for years, and then is discharged, and then the injury becomes "serious" and then (if the statute of limitations of from one to seven years will permit), a suit for damages is brought against the employer. Sometimes an injury does not amount to anything "worth while" until the right lawyer gets in touch with the injured person, and then it has a commercial value—and a suit for damages against the employer follows. A minor is sometimes injured and no one who is authorized to bring suit considers that the injury lessens in the slightest degree the earning power of the one injured, but when the minor becomes of legal age he thinks differently, and sues his old employer for damages. Delayed claims and suits of workmen for damages arising from bodily injuries are a source of great cost to every liability insurance company. The company must keep "in touch" with every accident reported until it is settled or outlawed.

COMPENSATION LOSSES CUMULATIVE.

As respects losses under any workmen's compensation law, the number of payments of compensation to injured employes and their dependents will be cumulative—as accidents happen—one added to another, as the years go by. Payments due to this year's accidents will begin this year and extend into other years, next year's payments will be added, the year following two year's payments will be added, the year thereafter three year's payments will be added, and so on. The total of such payments will start low and increase each year.

The insurance premium should be sufficient to carry all payments to maturity.

For the purpose of making these deferred compensation payments, insurance organizations must carry large reserves, and these reserves must come from premiums.

THE NEW YORK LAW.

Payments of compensation to injured workmen and their dependents will run for a longer time under the New York law than under any other law, for the reason that here we must pay compensation during the life of the injured workman, if disability lasts that long, and during the life of his dependents, if the injury causes death, whereas under other laws such payments only run during a certain number of years or until a certain total amount has been paid.

A SPECIFIC CASE.

Suppose that, after June 30, you hire an extra man for a week during some rush season.

Suppose that he is 24 years old, has a mother 45 years old, a wife 22 years old, a child 2 years old, and another child 1 month old, all dependent upon him for support.

Suppose you agree to pay him $20.00 for his week's work, that being the going wages.

Suppose he is killed during that week.

What may be the ultimate cost to you (or to your insurance company) for giving that young man one week's employment?

Listen:

	Annual Compensation.	Duration in Years.	Total.
Wife—Aged 22 years	$300	50	$15,000
Child—Aged 1 month	100	18	1,800
Child—Aged 2 years	100	16	1,600
Mother—Aged 45 years	150	25	3,750
			$22,150

Some one asks: "Are all employers in the state of New York subject to this new law?"

No; only those employing workmen in a trade or business specified—or included in general terms—in some one or more of the forty-two "groups" enumerated in the law.

THE LAW APPLIED TO MOTOR TRUCK TRADE.

As respects the motor truck trade, I am not sufficiently familiar with the business of each of you to say just which are "in" and which are "out," but I may say those workmen are covered by the New York Workmen's Compensation Law who are engaged in the operation of machine shops; power plants; longshore work, including the loading or unloading of cargoes, or parts of cargoes of grain, coal, ore, freight, general merchandise, lumber or other products or materials, or moving or handling the same on any dock, platform or place, or in any warehouse or other place of storage; construction, installation or operation of electric light and power lines; dynamos, or appliances, and power transmission lines; operation and repair of stationary engines and boilers; manufacture of traction engines, wagons, carriages, sleighs, ve-

hicles, automobiles, motor trucks; the operation, otherwise than on tracks, on streets, highways, or elsewhere of cars, trucks, wagons or other vehicles, and rollers and engines, propelled by steam, gas, gasoline, electric, mechanical or other power or drawn by horses or mules.

I guess that at least some of you are "in."

EVERY ACCIDENT COSTS MONEY.

If you have workmen engaged in any of the employments I have named (and they are only a few of the employments covered by the law), you must pay something for every disabling accident to such workman, either doctors' bills or compensation, or both.

The only exceptions are when the accident is caused by the willful intention of the injured employe, or when it results solely from his intoxication while on duty. Otherwise it does not matter how the accident happens or who causes it, if it arises out of and in the course of his employment.

Compensation payments begin after fourteen days of disability.

SCALE OF COMPENSATION.

The New York scale of compensation is, generally speaking, two-thirds of the injured employe's average weekly wages for the year previous, but not less than five dollars per week, nor more than fifteen dollars per week, excepting for the loss of hand, arm, foot, leg or eye, when the higher limit is twenty dollars per week. The payments must continue while the disability lasts.

If the injury causes the death of the workman, then the compensation must be paid to his dependents, those who were dependnt upon him for support.

The employer must also pay for "such medical, surgical or other attendance or treatment, nurse and hospital service, medicine, crutches and apparatus as may be required or be requested by the employe, during sixty days after the injury."

In cases of death the employer must pay the funeral expenses, not to exceed one hundred dollars.

ANOTHER ILLUSTRATION.

As showing what it may mean to employers operating under the law, I quote from a pamphlet written by P. Tecumseh Sherman, a high authority, as follows:

For permanent total disability every workman who is in receipt of wages of $22.50 per week or over, when injured, will be entitled to the miximum weekly payment of $15.00, or an annual pension of $780.00 for life. What will be the average cost of such pensions is an actuarial question. But foreign experience indicates that those drawing permanent disability pensions have a surprisingly long life expectancy. Consequently such pensions may run for sixty years or more, so that an aggregate of $46,800 in a single case may not be unusual.

The law is to be administered by the State Workmen's Compensation Commission, composed of five members appointed by the governor.

When a workman is disabled, the commission will decide the weekly compensation to which he is entitled, and it will collect the amount from the employer (or his insurance company) and pay it over to the workman. In case of the workman's death, the compensation will be paid to his dependents by the commission.

The commission is composed of exceptionally high-grade, broad-minded citizens who will deal out as even-handed justice as the law will permit.

A gentleman asks: "Is there no escape from this law?"

INSURANCE COMPULSORY.

No; the penalty is too great. Moreover, to make sure that injured workmen and their dependents will certainly receive the compensation which the law grants, the law requires employers to secure the payment of compensation in one of the following ways:

By insuring in a stock casualty insurance company;

By insuring in a mutual casualty insurance association;

By insuring in a State Insurance Fund;

By demonstrating to the State Workmen's Compensation Commission such financial solvency (or by depositing securities) as will warrant the commission to permit them to carry their own insurance.

STATE INSURANCE FUND.

As respects the State Fund, the law reads as follows: "There is hereby created a fund to be known as 'The State Insurance Fund,' for the purpose of insuring employers against liability under this chapter and of assuring to persons entitled thereto the compensation provided by this chapter. Such fund shall consist of all premiums received and paid into the fund, of property and securities acquired by and through the use of moneys belonging to fund and of interest earned upon moneys belonging to the fund and deposited or invested as herein provided. Such fund shall be administered by the commission without liability on the part of the State beyond the amount of such fund. Such fund shall be applicable to the payment of losses sustained on account of insurance and to the payment of expenses in a manner provided in this chapter."

NO MONOPOLY OF INSURANCE.

I am very sorry that there is not time for me to tell you why stock casualty company insurance will be much better for you than any of the other kinds the law permits you to carry, but I must take the time to say that while I believe that stock insurance offers the best and safest insurance for employers under the New York Workmen's Compensation law, yet I think that our lawmakers were wise in providing various means of insurance—as against a monopoly of any one kind—for by so providing each form of insurance must compete against all other forms, thus giving insurers ample opportunity to note how each kind works out in actual practice.

PRINCIPLE OF COMPENSATION ALL RIGHT.

The principle of workmen's compensation laws as distinguished from employer's liability laws can be successfully upheld from any and every point of view, and from adding that the greatest duty of stock insurance companies, mutual insurance associations, the State Fund, and all employers of labor is the closest possible cooperation for the prevention of work accidents.

The prevention of accidents is worth all the compensation for accidents in the wide world.

The care of the batteries is not troublesome; it requires the exercise of common sense and the following of simple directions.

Electric Vehicle Operation and Maintenance

Methods of the Government Printing Office in Securing Efficiency From Electrics

BY WALTER R. METZ

MOTOR trucks have their place, and the use of gas or electric vehicles depends on conditions, just as does the use of motor trucks over horses.

If a man is willing to plod along slowly and take what he can get, or if his business is only enough for a single horse, he would not be justified in purchasing motor trucks. On the other hand, if he wants long hauls and few stops, such as suburban delivery, he would certainly be justified in going beyond the electric and purchasing gas cars.

Delivering Paper to the Government Printing Office.

But I am firmly convinced that for city service, with road conditions as they now are in most cities, and with short hauls and a number of stops, the electric truck has a field of its own that will not be denied.

One of the first things to pay attention to in the operation of trucks is speed. The average person wants to travel fast and get there quickly, but when it is remembered that city service often means stops in each block and that the total standing time of trucks is considerably more than the running time, the speed becomes of less importance. Rather put more men on your trucks and cut down your standing time, than cut down on the labor and try to run at excessive speed to make up the lost time.

On our heaviest trucks we use three men and even with these the standing time, as shown by a service recorder is practically 50 per cent of total time. A truck, therefore, designed for moderate speed is what is needed and for this service an electric stands pre-eminent.

The trucks having moderate speed are also easier on the running gear and tires.

Let us consider the truck frame first and its running gear.

As soon as it is brought into the garage it should be examined for loose nuts, bolts, etc. All grease cups should be carefully examined, as should also the chains and sprockets. Lubrication is worth all the attention given it and this point alone may determine the practicability of electric trucks.

Trucks should not be washed down every night as is done in some places. This only is a waste of energy and tends to decrease the life of the painting, to say nothing of rust on those parts you may have forgotten to oil. Washing down twice a week is sufficient, excepting of course in time of rain and mud. Chains should be removed about once a month and should then be carefully cleaned and just as carefully oiled.

A heavy oil or grease is not good for chains, as it will not get into the bearings. A lubricant made up of light cylinder oil mixed with graphite makes a satisfactory lubricant and keeps the chain in good condition.

Tires are often a considerable factor in the expense of running trucks, but they need not be if

Garaging the Government's Electrics.

One Corner of the Battery Room.

proper attention is given to their sizes, quality, etc.

For example, I have seen tires that were very resilient, so much so in fact that the rubber flattened out to a great extent, and the truck was using up a great part of its power in pushing ahead the rubber just in front of the actual bearing of the tire on the ground. It had the same effect as running uphill continuously. On the other hand, I have seen tires so hard that there was no resilience to speak of and the owner might almost have used a wood or iron-bound wheel, as far as relieving the truck from strains was concerned. If a tire has the proper amount of resilience and the proper size is used there should be no trouble in getting 10,000 to 12,000 mileage.

I do not believe that the average owner pays proper attention to the size of his tires, but will accept what is given him by the manufacturer. I have seen a 1,000-lb. car of a certain make with 2½-inch tires front and rear, even though the rear wheels were carrying over 60 per cent of the load. This is not good practice and will certainly tend to shorten life.

I should like to see a standard adopted in common by manufacturers and users, based on certain sizes to carry certain weights. The Society of Automobile Engineers has taken a step in the right direction, but should go further, and I believe it will.

The government is taking up the tire question at the present time and I believe it will specify certain sizes of tires for certain loads in future work.

Charging batteries in cars is a comparatively simple operation, but is often done in a slip-shod manner. We often see loose ends of cable lying around the floor and the employe simply picks up one of these, places the plug in the receptacle and goes about his business. When the car is fully charged the cable is thrown on the floor and left there, catching dirt and rubbish and worst of all, water.

When this garage was designed we brought all cables overhead, then dropped the ends down, the free end being long enough to form a loop. To this loop there is attached a counterweight and the cable, when not in use, is high up and out of the way. When the car is to be charged the garage man pulls the end down with a special hook made for the purpose, and after the car is charged and the plug taken out of the car receptacle, the counterweight raises the cable out of the way. By adopting this method we have been able to keep the floor clear of wires of all kinds and it can be cleaned with a hose without any danger of ruining the cable.

Each car has a separate charging panel. This may seem unusual and in public garages would probably not be advisable, but the use of individual panels permits us to keep an absolute record of the current used by each car.

The panels are of the Cutler-Hammer make and on each are mounted a volt-ammeter, a double pole knife switch, fuses and contact segments by means of which the charging current is regulated.

At the bottom of each panel are mounted protective devices consisting of low current cut-out, which automatically opens the circuit if the current drops to a predetermined minimum, a maximum voltage cut-out to automatically open the circuit when the battery voltage reaches the point at which the cut-out is set to operate, a solenoid switch and on overload circuit breaker.

Each panel is numbered, and in the garage proper, a corresponding number is hung directly over the charging cable so that in shifting chauffeurs each one has only to know the number of his car and he can see at a glance the proper station.

We have also recently installed a wheel rack for keeping wheels off the floor. We have found it good practice to keep a spare wheel on hand for each size car, and if these wheels are kept on the floor all the time they are very apt to injure to some extent that part of the tire that bears the weight. This rack is nothing more than a heavy wood framework with pegs at proper intervals. The wheels are hung on these pegs by the use of a chain block attached to a trolley running on the lower flangs of our overhead I-beam.

The results have proven that we are fully justified in the purchase of spare wheels, for we have never yet been compelled to tie up a car on account of wheel or tire trouble.

It is well known that removing batteries from the cars is very apt to cause trouble, and to overcome this a special truck removes and transports the batteries without a jar. This truck is used in connection with platforms and is designed to have a height of about one-quarter to one-half an inch less than the height of battery in the car. The truck and platform are run up to the side of the car, the battery slid out onto the platform and a lever in front is then raised from a horizontal to a vertical position, raising the platform and battery about one inch or more off the ground, but still supported by the truck. It is then pulled to the battery room and the lever lowered, thus lowering the battery to the ground without any jar. The truck itself is then hauled from under the platform and used elsewhere. One truck will, of course, handle a number of cars and their batteries.

Care of Batteries—Probably the most important part of a car is its battery equipment, and the owner of a number of cars will be well repaid if he places competent men in charge to look after this detail.

Our batteries are looked over every night and the results have fully justified the trouble, for we have been running now for two years and seven months on the original batteries, and they are in a very good condition today, and apparently good for a long time.

In our garage we aim to give each battery a good overcharge every two weeks, and water the pilot cells just before the overcharge. The batteries do not usually need watering more than once in two weeks. Readings are taken immediately after overcharging, and we attempt to equal this reading each night. Readings of both hydrometer and temperature are taken as far as possible every day, the rule being to read twice each night, and special care is taken to compare temperature with gravity. When the temperature increases the hydrometer reading will drop, and it has been found that an increase of 10° F. will result in a decrease of 3 points in the hydrometer reading. If the results vary from the above, the battery man looks for the trouble and remedies it immediately.

A good point to remember in taking hydrometer readings is not to depend upon the first reading. If the hydrometer syringe is used on a certain battery and then on another, there is very apt to be a variation from the true reading of the second cell, but if some of the acid is drawn out and then put back, and drawn out a second or third time, the reading will be correct. The reason for this is that some of the acid from the cell first read may adhere to the syringe and it has

been found that the first reading is often from three to six points more or less than it should be, when there is a difference between the batteries tested.

Regulations You Should Know

Section 1. Vehicles shall keep to the right hand side of the road.

Sec. 2. Vehicles meeting shall pass each other to the right of the center of the road.

Sec. 3. All vehicles overtaking others shall, in passing, keep to the left of the center of the road and shall not pull over to the right of the road until entirely clear of the vehicle passed.

Sec. 4. All vehicles turning to the right into another road shall turn the corner as near the curb as practicable.

Sec. 5. All vehicles turning to the left into another road shall pass to the right of and beyond the center of the intersection road before turning.

Sec. 6. All vehicles crossing from one side of the street to the other shall do so by turning to the left so as to go in the same direction as the traffic on each side of the street.

Sec. 7. A vehicle shall stand only with its right hand side to the curb, except in the open country, where standing on the left will in no way interfere with traffic.

Sec. 8. Slow vehicles shall keep close to the right hand side of the road or to the right hand curb, leaving left hand space for faster moving vehicles to pass —the slower the speed the nearer to the curb.

Sec. 9. All motor vehicles before passing other vehicles from the rear shall give notice of approach by born or other signal before passing.

Sec. 10. Vehicles must not remain backed up on the side of a road or to a curb except to load or unload and then it must be in such a manner as not to seriously interfere with traffic.

Sec. 11. No vehicle shall stop on crossings except in case of accident or other emergency or when directed to stop by a police or traffic officer.

Sec. 12. No vehicle shall stand within ten feet of any intersecting street corner or crossing.

Sec. 13. Vehicles moving in a northerly or southerly direction shall have the right of way over vehicles moving in an easterly or westerly direction. United States mail, fire apparatus, ambulances, police patrols and vehicles of physicians when so designated, shall have the right of way in any street and through any procession.

Sec. 14. Drivers of all vehicles shall indicate by hand or whip their intention of stopping or starting and no vehicle shall be started forward or backward until the driver has first looked to see that the way is clear.

Sec. 15. No vehicle shall pass to the left of the center of any road except where passage on the right of the center is blocked or where the roadway is occupied by slower moving vehicles and then only in case there is an open roadway to the left of the center of the road.

Sec. 16. No vehicles, unless in emergency or to allow another vehicle or pedestrian to cross its path, shall stop in the road except near the right hand side or curb thereof.

Sec. 17. Vehicles moving forward on the right hand side of the roadway wishing to stop on the left side shall turn around before stopping so that when motion is resumed said vehicles shall proceed along the right side of the roadway.

Sec. 18. No vehicle shall be backed without ample warning having been given, and while backing, care must be exercised not to injure vehicles in the rear.

Sec. 19. All vehicles occupying any road or roadway shall carry lights at night between one-half hour after sunset and one-half hour before sunrise. Vehicles carrying a single dash lantern shall carry same on the left hand side, so that it can be seen from either direction.

Sec. 20. All vehicles shall be driven carefully with due regard for the safety and convenience of all other vehicles and pedestrians. Nothing herein or omitted therefrom shall be construed or held to relieve any person or vehicle using, or traveling or being upon any road for any purpose whatever from the exercise of all reasonable care to avoid or prevent injury through collision with all other persons and vehicles.

RULES OF THE ROAD FOR PEDESTRIANS.

Section 1. Pedestrians shall keep to the right and shall not stop or stand on sidewalks or road crossings so as to obstruct their free use of others.

Sec. 2. Pedestrians shall not stand or walk on or in any way occupy roads or roadways except while crossing same at indicated crossings.

Sec. 3. Pedestrians shall not step upon a roadway from a sidewalk or at crossings or elsewhere without first looking to see all traffic approaching that point from either direction and they shall not cross the roadway diagonally or at any other point except at regular indicated crossings. Neglect to observe the requirement of this section shall be prima facie evidence of gross negligence and carelessness and, in case of accident resulting in injury the responsibility for said accident shall be placed upon the person so injured unless it can be proven otherwise. Nothing in this regulation, however, shall relieve drivers of vehicles from being constantly vigilant, exercising all reasonable care to avoid injury to persons and property.

Sec. 4. Pedestrians shall have the right of way over all vehicles at designated road crossings only, but in crossing they shall not loiter and shall continue to cross the roadway without stopping.

Sec. 5. No person shall jump, stand or ride upon any vehicle while standing without the consent of the owner and under no circumstances while in motion, while the vehicle is on a road or roadway.

Sec. 6. No person shall use roller skates, coasters, tri-cycles or any other vehicle, toy or other articles or wheels or runners (excepting bicycle) or operate the same on any road or roadway.

Sec. 7. No one shall carry children on bicycles under the age of five years.

National Electric Vehicle Day

Robert Montgomery, manager of the commercial department of the Louisville (Ky.) Gas and Electric Company, has suggested setting aside a certain day throughout the country as "Electric Vehicle Day." On such a day, preferably a holiday, Mr. Montgomery suggests that an electric vehicle parade be held demonstrating the extent to which electricity is used for driving passenger and commercial cars, prizes to be awarded by local concerns for the most attractively decorated truck or pleasure car.

Fifth Annual E. V. A. Convention Activities

Important Announcement of the Papers Committee and Reports of the Section Secretaries

BY A. JACKSON MARSHALL

CONSIDERABLE progress has been made in the matter of the Fifth Annual Convention of the Electric Vehicle Association, which this year will be held at the Hotel Bellevue-Stratford, Philadelphia, Monday, Tuesday and Wednesday, October 19-21. All of the convention committees have been organized and reports indicate most interesting developments. Perhaps one of the most important announcements that could be made at this time is in connection with the work of the Papers Committee. To date the following tentative program has been arranged for:

ELECTRIC VEHICLE ASSOCIATION PHILADELPHIA CONVENTION PAPERS.

Papers *Author.*

1. President's Address ..... Frank W. Smith

Reports.

2. Executive Secretary ..... A. Jackson Marshall
3. Committee on Membership and Formation of Sections ..... Joseph F. Becker
4. Committee on Operating Records..... W. P. Kennedy
5. Garage and Rates Committee..... John F. Gilchrist
6. Insurance Committee ..... Day Baker
7. Papers Committee ..... S. G. Thompson
8. Committee on Legislation..... P. D. Wagoner
9. Committee on Educational Courses..... M. W. Alexander
10. Standardization Committee ..... E. R. Whitney
11. Traffic Committee ..... D. C. Fenner
12. Good Roads Committee..... Col. E. W. M. Bailey
13. Central Station Co-operation Committee.. W. W. Freeman
14. Parcels Post Delivery Committee..... James H. McGraw
15. Railroad Development Committee..... S. G. Thompson
16. Motion Picture Film Committee..... W. C. Andrews
17. Constitution and By-Laws Revision Committee..... Frank W. Frueauff

REPORTS OF THE SECRETARIES OF THE SECTIONS.

18.

Section.	Secretary.	Section.	Secretary.
New England	L. L. Edgar	Los Angeles	J. F. Rogan
Chicago	F. E. McCall	Pittsburgh	J. A. Jocques
Philadelphia	J. C. Bartlett	New York	.....
Washington	C. M. Marsh	Detroit	J. W. Brennan
Cincinnati	P. H. Kimble	Cleveland	.....
San Francisco.	J. W. Redpath	Toronto	.....

Papers. *Author.*

19. Progress of the Electric Vehicle..... James H. McGraw
20. Unusual Application of Electric Trucks.... F. Nelson Carle
21. The Motor Truck in Terminal Freight Handling..... S. G. Thompson
22. Electric Vehicles in Parcels Post Service.. W. P. Kennedy
23. National Electric Light Association's Electric Salesman's Handbook; (with especial reference to electric vehicle section) ..... T. I. Jones
24. Electrical Industrial Truck (symposium) ..... General Vehicle Co., Automatic Trans. Co., Elwell-Parker Co., C. W. Hunt Co.
25. Educating the Public to the Field and Use of the Electric Vehicle ..... F. C. Henderschott
26. Electric Fire Apparatus ..... Chief Walker, Philadelphia Fire Dept.

Additional papers will be announced from time to time.

The development which the year 1913-14 has witnessed in the electric vehicle field is phenomenal. Starting off last year in October the Electric Vehicle Association had but 437 members, with but two cities in which local organizations had been organized. Since that time the membership has been increased to approximately 850—about 100 per cent—and the sectional representation has expanded until it now includes New England, Chicago, Philadelphia, Washington, Cincinnati, San Francisco, Los Angeles, Pittsburgh, New York, Detroit, Cleveland and Toronto, with expectations of having local sections in the immediate future in Buffalo, St. Louis and three or four other cities.

In each of these local sections organized efforts are being put forth to promote the sale and use of electric vehicles, both passenger and commercial, and it is safe to predict that these mediums will greatly facilitate electric vehicle development work in the year 1914-15.

The association has built for itself such a substantial reputation that users and prospective users throughout the country have come to a realization that for accurate information the association is the proper source. Every means has been exhausted in an endeavor to establish a general bureau where those interested in delivery service can avail themselves of information about electric vehicle service. In giving this impartial information many prospects have become actual users. The industry has fared well and the vehicles are proving their value. In its early history, the association lacked systematic publicity. During the past year, a competent bureau has been established. And through the efforts of this bureau the electric has been kept constantly before the public. The association through its bureau has likewise acted as a Schafer.

To Analyze Charging Costs

With the installation of a 100-kw and a 25-kw motor-generator set, a six-panel switchboard and additional charging circuits and meters, the Royal Electric Garage, 556 East Fortieth street, Chicago, will make an effort to analyze the charging costs of the cars in its care. In addition to the meters installed by the Commonwealth Edison Company, the garage owners will connect a graphic meter on the alternating-current circuit to determine the characteristics of the garage load and will use direct-current meters to obtain records for each car. At present the garage has space for accommodating 140 machines, with facilities for charging 65 cars simultaneously.

G. V. Central Station Trucks

For the last three years the Georgia Railway & Power Company, Atlanta, Ga., has had in service a 750-lb. electric wagon, which during that time has completed a total travel of over 30,000 miles, 25,000 miles of which was made on a single battery. There was one renewal of tires, and with the exception of the second battery the only repairs amounted to one hub cap and one chain.

In its gas-installation division the same company has another 1,000-lb. General Vehicle wagon which made 16,500 miles in three years. The repairs for a period of more than two years ran less than $400. Another 2-ton truck in service two years has made 10,000 miles and is still using the original battery.

Are Electric Vehicle Men Too Confident?

A Few Fundamental Limitations to Popularity of Electric Vehicles as Pointed Out by a Gas Car Expert.

BY R. W. HUTCHINSON, Jr.

IN ALL the discussion which has ensued since Dr. Steinmetz read his notable paper on the future of the electric vehicle before the recent Electric Light Association Convention in Philadelphia, everyone appears to have overlooked the vital economic facts which militate against the fulfillment of that great scientist's prophecy.

I believe that the many enthusiastic promoters of the electric delivery vehicle ignore certain fundamental conditions which have inhibited and will continue to inhibit the popularity of the electric truck. I do not in any wise belittle the splendid truths which Dr. Steinmetz has enunciated in his paper. In all the world today there is no electrical scientist nor electrical engineer who outranks him in genius and in practical invention. When the history of electrical invention in the twentieth century shall have been written the name of Steinmetz will be, I predict, first and foremost among the immortals.

None of us who have listened to Dr. Steinmetz's abstruse statements on the theory of electrical machinery but has sat enthralled and has marvelled at the extraordinary originality and clearness of reasoning which are always uppermost in his contributions to electrical theory and progress.

But Dr. Steinmetz, like many great engineers and scientists, is given to dreaming big dreams; and in painting for us a picture of a day but little more than a decade hence, when 2,000,000 electrical vehicles will be in service in the United States, Dr. Steinmetz is exceedingly visionary.

The fundamental fact is that the public may want the electric and yet cannot afford to pay the initial price which the electric truck manufacturer must get for his product today in order to make a legitimate profit and to live. The price of the electric car during the twelve years in which it may be said to have been commercialized in this country has not decreased 5 per cent—indeed, it has increased, due to the fact that in recent years there has been developed a more efficient secondary electric cell or battery, which is more expensive to make, and naturally the most costly battery to buy.

Obviously, the new battery, which in capacity sufficient for say a 1,000-pound car, costs today about three times that of its crude progenitor, the pasted lead plate battery, brings up the cost of an electric truck in like capacity to say 40 per cent more than what it is if equipped with the older type of battery. This means that a 1,000-pound electric delivery car, equipped with the alkaline battery, costs about $2,000 or $2,300 equipped with the most ordinary type of body. Even if equipped with the usual form of lead battery the cost of the half-ton electric delivery car is from $1,700 to $1,900.

The crux of the problem of introducing the electric truck hinges upon the important fact that the percentage of small tradesmen and merchants who constitute the natural marketing possibilities for the sale of electric trucks, cannot afford to pay even $1,500 for a 1,000-pound vehicle. It matters not what the vehicle will do in increasing the delivery territory, in increasing their selling opportunities or how economical it is. The small tradesman who wants the electric cannot afford to buy it.

I mention the 1,000-pound electric specifically, because those of us who have analyzed the future of the mechanical vehicle know that the possibilities for the selling and utilization of a mechanical vehicle—whether gasoline or electric—are ten times greater on the ½-ton to 1-ton truck than on other sizes of units.

In my judgment, the solution of the selling difficulties and the consequent popularizing of mechanical vehicles is today easier for the gasoline than for the electric truck builder. The difficulties in the way of bringing the price of the electric truck within the reach of its largest class of users are mainly inherent. Those of us who have been intimately connected with the electrical industry know that today after a century or more of development, the pasted lead secondary electrcial cell is not much further along in some respects than it was in the days of Gaston Plante.

The lead plate electrical battery is admittedly the crudest, most imperfect piece of electrical apparatus in the whole gamut of electricity. Even Dr. Steinmetz is accredited with having stated, "I have tried long to invent a lead battery which would not spoil, but I have had to give it up." For stationary power plant service, where the apparatus is under the charge of a skilled engineer, the lead battery performs its function excellently, and it is of vast economic importance. But when you put an electric battery in a moving vehicle that is subject to frightful road vibrations, ignorant abuse, etc., it is being called upon to perform service which it was never intended to exercise. As for the alkaline electric cell, it is too expensive in the present state of ignorance of the public of what it will do to be popularized.

We cannot hope to look for an appreciable reduction in the cost of either the lead or the alkaline battery. The metallic elements which enter into the manufacture of both types of batteries are relatively scarce, and unless more lead and nickel mines are discovered the available supply of both metals will not increase but decrease.

The advantages of the electric truck are well known and admitted by every one in the truck industry, and I would gladly rather promote the use of and be engaged in the manufacture of electric trucks than gasoline trucks. Scarcely a week passes that I do not have occasion to advise prospective truck buyers that they can use electrics more profitably than gasoline trucks in their business. From the very fundamental laws of mechanics, a rotating prime mover can always be built simpler and more fool-proof than a reciprocating machine.

The electric inventors must find a substitute for the prime mover of the electric truck—the battery—and that prime mover must be something simpler and cheaper than the chemical prime mover. When that

is done the selling price of the electrical truck can be brought down to a point which will popularize it in the real sense of the word. Then and not until then will Dr. Steinmetz's glorious vision of the two million electrics in use actually come about.

The Central Station Electric Association is doing a valuable work in the large cities. Electricity is doing so many things in the home, in the factory and in every avenue of human endeavor that the public is eager to use electricity; but it matters not how much of a propaganda the promoters engage in, they cannot ignore the economic law which militates against the progress which they deserve. I have no controversy to bring with the Electric Vehicle Association of America or the central station companies, but I do believe that they have but poorly and crudely visualized the kind of publicity which they should really do to augment the popularity of the electric passenger and freight vehicle. They have not got under the skin of the potential and ought-to-be user of the electric because they have not told him the things that he wants to know.

Practically all that I have said as to the economic problem of the situation applies equally as well to the popularizing of the gasoline truck. Our editorial friends in the truck publication field crow about the nine thousand odd trucks now running in New York City, and speak of New York's wonderful motorized highway commerce. When one goes beneath the surface and finds from statistics that the number of horses in use in Greater New York varies from 180,000 to 250,000, it is clear that we have hardly scratched the possibilities of motorized commerce, even in our largest city.

We all know that the present prices for good motor trucks cannot be materially reduced until the era of quantity production can come about in the truck business.

I do not wish to introduce any controversy between myself and the electric interest in the frank statement above. The few companies in the electric truck business who have achieved success have achieved it deservedly, and theirs will be an even larger success. But I do maintain that our enthusiasm as to the future of the electric truck should be tempered with a plain, cold statement of the difficulties in the way to bring this about. I have an interest in the success of the electric (as well as the gas) truck, since for some years I was connected with the electrical industry.

The future for the electric truck is even brighter than for the gas truck, but when a visionary prediction of two million electrics in ten years is made Dr. Steinmetz is stating an utter economic impossibility.

New York Revises Charging Rates

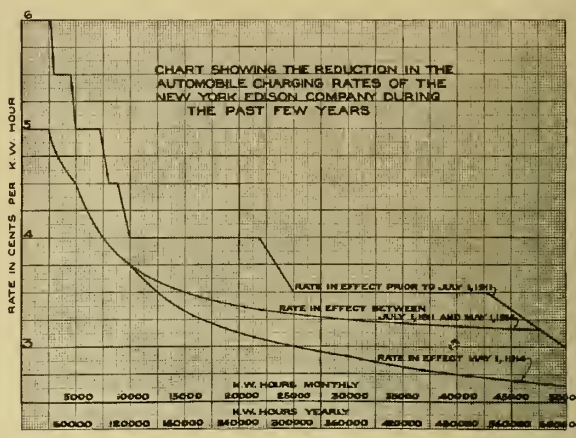
A revised schedule of rates has been issued by the New York Edison Company for charging storage batteries and electric vehicles as effective May 1, 1914, are given hereunder:

RATES DEPENDENT UPON A MINIMUM MONTHLY BILL OF $25.

First 2,500 kilowatt-hours monthly at 5 cents.
Next 2,500 kilowatt-hours monthly at 4 cents.
Next 5,000 kilowatt-hours monthly at 3 cents.
Next 20,000 kilowatt-hours monthly at 2½ cents.
Next 20,000 kilowatt-hours monthly at 2¼ cents.

Excess over 30,000 kilowatt-hours monthly at 2 cents.

In this connection the Edison Company has published a chart showing the reductions made in the past four years in electric vehicle charging service, showing the cost per kilowatt-hour consumption of from 5,000 to 600,000. Prior to July, 1911, the rate



for 5,000 kilowatt-hours was 5 cents; under the new schedule the rate is 4½ cents. For 15,000 kilowatt-hours the rate in 1911 was 4 cents; under the new schedule the charge is 3¼ cents; for 25,000 in 1911 the rate was 3½ cents; the new rate is 3 cents. For 50,000 the rate in 1911 was 3 cents; under the new schedule it is 2¼ cents. Over 50,000 the rate per kilowatt-hour is 2 cents.

Lansden Resumes Manufacture

The Lansden Company, Limited, has leased large factory buildings at Flatbush and Nostrand avenues, Brooklyn, and will shortly begin the manufacture of Lansden electric cars and trucks.

The company has secured the entire plant and good will of the old Lansden Company at Newark, N. J. The concern was organized and owned by Thomas A. Edison and was one of the pioneers in the electric commercial vehicle field.

J. B. Wickery is the new general manager, and under his direction new and modern machinery is being installed. It is proposed to manufacture completely at the new factory electric delivery cars and trucks of every description.

A service station for users of the company's vehicles and also a charging station for all electric commercial and pleasure vehicles will be installed.

Proposes a Waterfront Terminal

The Merchants' Association of New York City has appealed to the governor to present to the extra session of the legislature a request that such legislation be passed as will make possible the construction of the terminal waterfront railroad proposed for Brooklyn, this to be used jointly, with equal interests in a holding company, by all railroads entering that portion of the city, and that a public hearing be held for the purpose of determining the sentiment of the business men relative to the proposition. If the railroad is constructed the belief is that it will be extremely productive of business promotion.

Controlling Storage Batteries

A New Instrument Which Detects Battery Overload and Eliminates Sulphation

IN the working of storage batteries a great deal of trouble arises which would not be experienced were proper methods of control employed. The main cause of the trouble is overdischarge, with consequent sulphation, the final effect of which is the buckling of the positive plates and the contraction of the negative paste. Over-discharge may occur through various causes, and may be an over-discharge on the whole battery or on a few cells only. If internal short-circuits develop in a cell, as they are always liable to do, and are not cleared in a short time, that cell very soon gets over-discharged, the plates become sulphated and the positives buckle, and in time cause more serious short-circuiting. When there are several cells like this in a battery it is not possible to get the full output from it, and the mistake is often made of over-charging the whole of the cells, with the result that the active material on the positives in the good cells is thrown off by excessive gassing, and

Fig. 1. The Battery Load Detector.

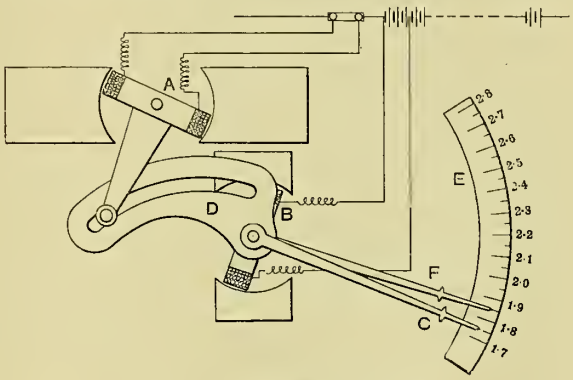


Fig. 2. The Working Arrangement.

spongy lead is formed on the negatives in such a way that it causes further short-circuits by "treeing" across and getting into contact with the positives, particularly in cases where the separators have become displaced. This trouble is, unfortunately, cumulative, for the shedding of positive active material reduces the capacity and increases the possibility of over-discharge, with the result that in a short time the battery may be in a very bad condition.

A frequent cause of over-discharge is the working of the battery at varying rates. A battery attendant or shift engineer may know, for instance, the one-hour, three-hour, five-hour and seven-hour rates of the battery, and provided he worked at any one of them during the whole of a discharge no difficulties might arise; but if he works during the discharge at rates varying from the half-hour to the ten-hour discharge, occuping, say, three hours, entirely different conditions obtain, and few men who are in charge of batteries, with instructions to get the most out of them, can always be depended on to stop the discharge under such conditions before the damage is done. In addition, it is usually forgotten that it will pay not to take the full capacity out of the battery, and so run the risk of ruining cells—as described in the opening paragraph — which, through natural causes, have become a little weak, and that the full specified capacities at various rates can only, and should only, be obtained after a full charge, in which it is ensured that every cell is brought fully up.

In order to eliminate the human element as far as possible, and prevent damage from the conditions mentioned, the battery overload detector has been developed. The operation of this instrument depends on the fact that, for every value of battery current, there is a definite final value for the voltage of each cell below which it is unsafe to go, and the arrangement of the working parts of the instrument is such that, when the final value of the voltage is approached, corresponding to the current at any moment of working, this fact is indicated at the switchboard, and if the voltage is actually reached an alarm may be given, or a record made, or both. Before this point is actually reached, if the battery is working at a high rate of discharge, the current should be reduced, which will enable the battery to run for a further period at the reduced rate; but, if working at a high rate, the discharge should be stopped and the battery put on charge.

Such an instrument is of the utmost value on electric battery vehicles. The batteries on these vehicles are subjected to very varying currents, and are frequently very badly damaged by being over-discharged. The instrument for this class of work is made to give an exceedingly clear picture of the battery's condition. It indicates:

1. Total battery voltage.
2. Actual voltage per cell.
3. Permissible final voltage per cell.
4. Actual value of current.

All these being shown on one instrument, there is practically no excuse for a chauffeur who handles his battery badly.

There are two movements in the instrument, one that of a coil the displacement of which from its zero position varies with the value of the battery current, the other that of a coil the displacement of which

varies with the voltage of the whole or part of the battery. The former, or current coil, moves an arm in such a way that the movement of the arm is proportional, not to the value of the current, *but to the value of the permissible final P. D. corresponding to the current, whatever the current may be.* This arm may, therefore, be made to move over a scale of voltages which may be calibrated in terms of volts per cell, and over which a pointer may move which is actuated by the second or voltage coil previously referred to. The latter pointer will—on discharge, of course—always point to a higher voltage than the current coil arm, which may be termed the limit indicator, until the limiting value of the voltage is reached on discharge, when the two will coincide, and it is the approach of the voltage pointer to the limit indicator which warns the attendant to be careful, and the final coincidence which operates the alarm or makes the record.

The instrument, an external view of which is shown in Fig. 1, is neat and compact. The standard pattern is similar to a 6-inch or 8-inch dial indicating instrument, but somewhat deeper to accommodate the double movement, and it can be supplied to suit any size of battery.

The figure shows an instrument for use in central stations, the ranges being those on an instrument actually at work. It is of the 8-inch dial size, the one-hour rating of the battery is 800 amperes and the final permissible voltage corresponding to this is 1.7 volts per cell. Other final P. D.s are proportional to the currents, and the currents are, therefore, marked on the scale. It should be noted that the instrument illustrated only operates on discharge, and that the voltages above the currents to the left of the zero point on the current scale are not final permissible values.

The principle of operation of the instrument is shown diagrammatically in Fig. 2. *A* is the movement responsive to current and *B* that responsive to voltage. *A* moves the limit indicator *C* through a cam face on the part *D*, so that it takes up the correct position on the scale *E*, corresponding to the value of the current flowing. The movement of the voltage pointer *F* is independent of that of *C*, but coincidence of its position and that of *C* completes a circuit if necessary which rings a bell or makes a record, or otherwise gives an indication that the limiting conditions have been passed. The alarm will sound until the current has been reduced to a safe value or the battery circuit broken. Where it is permissible, as is frequently the case, to make the final allowable P. D.s directly proportional to the current, the link between the current coil and the limit indicator may be omitted, the latter being fixed directly on the coil. This is so in the pattern shown in Fig. 1, on which a scale of amperes has been plotted concentric with the scale of volts.

One common method of controlling a battery is termed the voltage method. A definite voltage, usually not erring on the high side, is settled as fixing the point when the battery discharge must be stopped. This, of course, is worse than useless unless the voltage is always read across a specified number of cells, which it is not. However, even supposing it is, the method is not a good one. In the case of a battery of 130 cells on one side of a three-wire system the final permissible P. D. would be 234 volts at the five-hour rate and 221 volts at the one-hour rate. These figures correspond to 1.8 and 1H.7 volts per cell respectively. For various currents between the one-hour and five-hour rates the final P. D.s will be different. Which figures would an engineer settle on? It is not often that the man in charge is given a range for various currents. Assuming that 234 volts is the chosen figure, and that the voltmeter is reading 6.5 volts high at this point—many instruments used for this work are out very much more than that—and also that the battery is discharging at the five-hour rate, the result is that, if the discharge is continued until the voltmeter reads 234, the cells are discharged to an individual voltage of 1.75—i.e., they have been severely over-discharged even if they are all in good condition and no cognizance is taken of the individual cells, which are generally to be found in every battery not quite so good as the remainder. A pressure of 6.5 volts more or less on the main voltmeter does not sound much, but it makes a considerable difference to the cells.

It should be observed that the scale—the length of which in the instrument illustrated is 6¼ inches—covers a range of 1.7 to 2.05 volts, giving a scale of 0.056 volt per inch. When it is remembered that the standard form of battery switchboard voltmeter for a battery of 130 cells on one side of a three-wire system reads 0 to 360 volts on the same length of scale, corresponding to a maximum voltage of 2.75 volts per cell, or about 58 volts per inch, it will readily be seen that there is no comparison between the utility of this instrument and that of the ordinary switchboard voltmeter.

The advantages which this instrument possesses over ordinary integrating ampere-hour or watt-hour meters are obvious. Integrating meters have a field in which they are exceedingly useful, but it is not as controlling instruments in ordinary battery work. The reading of such an instrument is useful in certain circumstances as a record but what is wanted to control a battery is not an integrating but an indicating instrument. The reading of an integrating battery meter has very little value for the purpose of control where the battery has been worked at varying rates; yet the majority of engineers are content to treat their batteries—plant of a valuable and expensive character—in such a way that their condition is absolutely dependent on the reading of such an instrument. It is a common custom to specify that the meter which records the charge shall run 10 per cent slow, as compared with that which records the discharge, and for battery users to adhere strictly to this, the battery being considered fully charged when the charge meter records the same as the discharge one, overlooking the fact that the percentage over-charge required by the battery depends on the rate at which and the extent to which it has been previously discharged, the period (if any) during which it was standing in a discharged or partly discharged condition, and the equally important fact that the integrating meters are not sufficiently accurate on all loads to justify absolute reliance being placed on them in this class of work.

For the user, therefore, who maintains his own battery, an instrument such as this overload detector is invaluable, and the saving in repair and trouble to be effected by its use will quickly repay the small initial cost of installation.

Users who have contracted for the maintenance

of their batteries will also find it very much to their advantage to install this instrument, as it is to their direct interest to keep the cost of maintenance of their battery as low as possible, for every renewal of plate occasions a certain amount of interruption to the normal working of the plant.

The battery overload detector is used by the E. P. S. Co. to simplify the system of keeping records of the batteries under maintenance. Under this system the work of logging is reduced to a minimum, and nothing need be put on record that is not of direct advantage. The work of the battery attendant is better organized and directed than was the case in older systems. In addition, it should not be overlooked that a considerable saving in first cost of switchboard can be effected by the installation, right at the beginning, of the instrument which has been described.

When this instrument is installed the actual working of the battery, as distinguished from the ordinary care of it, can be left in the hands of a very unskilled person, provided he remembers that he has to obey the instrument even when it contradicts his own ideas as to how long the battery should go on discharging. There is no reliable way of telling when a cell is exhausted at any particular rate but by the value of its voltage, and this the instrument does automatically.

The instrument can be made to work on charge just as it does on discharge, but there is little need for this, for, if the indications of the instrument have due attention paid to them, undercharging will very soon be made apparent by the fact that the limit of voltage, the signal for recharge, will be increasingly sooner reached.

The writer's experience has been that many batteries are permanently injured, and even ruined, through lack of proper methods of control, although in charge of a conscientious attendant, and he is quite convinced that the lives of all batteries would be increased, in many cases more than doubled, were the instrument described installed and its indications properly attended to.

Chicago Electric Garage Owners' Association

Chicago electric garage owners and electric vehicle manufacturers and agents have organized a new society knnwn as the Chicago Electric Garage Owners' Association.

The new body has been formed for the sole purpose of representing electric vehicle and accessory interests—of promoting the adoption and better garaging of the electric battery propelled vehicle.

The officers and members of the new organization are active promoters of electric vehicle interests who, because of a controversy arising in the Chicago Garage Owners' Association, embodying the entire field, gas and electric, found it necessary to form a new body devoted exclusively to promoting electric vehicle interests.

Where in the older society, the constitution deprived electric vehicle manufacturers of equal voice in the organization and permitted only certain mutual discussions open to such interests, the new organization on the contrary will discuss only those features peculiar to the electric exclusively.

The vast difference in the nature of the gas and electric automobile both from a technical and sales point of view denotes the necessity of such an organization. Chicago, unlike many other cities, has a great number of electric vehicle users. This clientele furnishes an important revenue to garage interests in this city. Many exclusive electric garages in Chicago are amassing large patronage and are fully equipped to take care of the electric.

Such enterprises have little in common with an organization that devotes the majority of its efforts in advancing the gas type of vehicle. Consequently the new association is a necessary factor—a splendid medium between the manufacturer, garage owner and user.

The Electric Vehicle Association, Chicago Section, has signified its desire to co-operate in all matters pertaining to boosting the electric in general and promote service "electrically." As its press representative Electric Vehicles will publish monthly the official reports of the new Association.

Many advantages are offered in a membership. A closer relationship among manufacturers and electric garage men is a direct result. Where the manufacturer has previously recommended gas or electric garages in general, the new body will recommend those stations which by their membership carry on business under those methods found most advisable by the organization. Special investigating committees on new ideas and methods will determine the worthy features for the proper garaging of electrics. Constant reports will furnish garage owners with new suggestions for improving their service—suggestions which have never been investigated and brought to light by the efforts of any organization previously. These new developments will introduce a new and better service based on actual facts and figures. The garage owner will be able to secure a better profit; the manufacturer's product will remain in constant service, and the user will likewise secure more efficient service at a reasonable expenditure. Such efforts will, no doubt, encourage many in the use of electric vehicles. The society needs the co-operation of every electric garage, manufacturer and dealer.

Edison Battery Test

An interesting comparative test demonstrating the hill-climbing ability of a duplex-drive model 48 Detroit electric car equipped with Edison batteries was made recently at Orange, N. J.

The test was a run up Eagle Rock Hill, the grade being 25 per cent, and one mile long. The car carried five passengers. The grade was easily made by the car at a rate of eight miles per hour. There was absolutely no bad effect on any part of the mechanism.

New Electric Garage for New York

Announcement is made of the opening of the Exide Battery Depots, Inc., on Twenty-third street near Tenth avenue, New York City. This garage, exclusively for electric vehicles, is modern and complete in every respect. With room for 100 commercial electric cars, it is claimed that it is one of the largest public garages in the country. The United Electric Light & Power Company, which supplies the electricity used in this service station, has been instrumental in introducing a great number of cars and is waging an energetic campaign in bringing the attention of New York's merchants to the economies effected by the modern electric vehicle.

Reviewing the Early History of the Electric

Report of the Committee on Electric Vehicles of the Ohio Electric Light Association

BEFORE entering into discussion of the electric vehicle of today, it may be interesting to glance at the history of this means of horseless transportation.

As far as we have been able to determine, the electric vehicle on roads was first attempted in France and England, in 1887. In 1894, Jeantand, a Frenchman, manufactured commercial electrics, one of which took part in the races at the Paris-Bordeaux, covering some 600 kilometers (375 miles) of the race by frequent recharging. During 1895, two electric storage battery vehicles competed with a gasoline car built by Charles E. Duryea, in a trip around Chicago. The electrics were built by a Philadelphia battery company to help in developing the business. They made a creditable showing, and in 1896 one of the leading motor car concerns of that time gave out the statement that it had passed the gasoline stage and after several years of experimenting had settled on the electric storage battery as the best means of furnishing energy for propelling horseless vehicles. Electric cabs were put on the streets of New York in 1899, and, though crude and cumbersome, they worked for ten years. At this time, a number of companies were organized for the manufacture of electric vehicles, but the vehicles did not live up to the expectations of their promoters. The rapid development of the gasoline car so far overshadowed the electric that during 1900-1904 there was a decided decline in popular interest. By this time the promoter had come to earth—companies had been reorganized and manufacture started on a more rational basis, until in 1913 it represented a production of 5,000 passenger and 1,448 commercial cars of a type which will fulfill the guarantees placed on them and give the service required. According to the most reliable figures obtainable, there are today 7,085 commercial electric vehicles in use in this country.

It will probably be of interest to discuss one of the earliest types of pleasure cars made. This car was driven by Mrs. Thomas A. Edison. There is certainly a great contrast between it and the latest electric, with its beautiful body and luxurious refinements. In place of the crude old piano box body, with its little cramped-up seat, the modern electric coupe is a drawing room on wheels. Every detail is designed for the greatest comfort and luxury. Rich, imported upholsteries, cut glass lamps and flower vase, complete novelty toilet set, and an imported Swiss eight-day clock, are only a few of the appointments to be found in such cars.

The present commercial electric truck needs no further development before taking its place as a highly efficient, economical means of city transportation. It is today doing this. A survey of the number of large installations of the size and character shown in everyday service, should be convincing.

Successfully filling the demand for a high-class pleasure and a reliable commercial vehicle has not been the only direction in which the electric has made progress. There are already a number of special applications; among which the tractor seems to have made a permanent place for itself.

Development of electric trucks for special features of central station work has advanced considerably. ompanies using this equipment report that it is far superior to anything heretofore available for such work.

At this point, it is believed that mention should be made of the industrial electric truck which is taking the place of hand-pushed trucks for moving baggage, freight, manufactured products, etc.

The extent to which this type of electric truck is likely to be used is indicated by the size of several installations already working, such as that of the Detroit River Terminal Company, operating ten in Detroit; the Lehigh Valley Railway, which operates fifty at Buffalo; the Grand Central Terminal Company and American Express Company, operating together forty in New York City, and many others elsewhere.

The mere ability of the manufacturer to produce an efficient electric vehicle, of pleasing appearance, has not been sufficient to satisfy central stations that it has become an unlimited commercial success nor to justify them in unreservedly endorsing it to their customers for all purposes. With more thorough experience has come the conviction that within its proper sphere of operation of the electric truck as today constituted is highly efficient, but that outside of that sphere it is not as economical as other forms of horseless transportation. Some of the early experience has also been misleading, influenced by lack of knowledge, by improper use of the truck, by early failures of electric trucks to make good. But with the truck as highly perfected as it is today and the storage battery so greatly improved, the confidence of central stations in electricity as a means of transportation is being very fully restored. The wide actual use of electric trucks by express companies and other large users of transportation vehicles is also an object lesson which cannot be ignored. The following schedule of figures is illuminating.

	Passenger.	Commercial.	Total.
New York has approximately....	498	1,700	2,198
Chicago has approximately.....	2,500	636	3,136
Denver, Colo., has approximately	850	65	915
Washington has approximately..	775	270	1,045
Hartford, Conn., has approximately	300	50	350
Baltimore, Md., has approximately	19	89	108

These six cities alone have some 4,932 pleasure and 2,810 commercial electric vehicles, and it is safe to say they represent varied conditions of wealth, topography and paving. It will possibly be of more interest if we analyze the conditions existing in a few of our Ohio cities.

A glance at Table A will readily indicate the inequality of development and the members can either compliment themselves on their comparative success, or figure out the cause of the comparative failure.

TABLE "A."

	Population 1910 Cen.	Pleasure.	Truck.	Miles Paved Street.	Miles Unp'd Street.	Top.	Cur. Rates.	Elec. Garages.
Cincinnati	363,591	300	65	608	300	Ext. Hilly		
Cleveland	560,663	2,000	95	495	327	F. Level	5c	Sl. Scale
Columbus	181,511	450	8	234	100	F. Level	4c	Sl. Scale
Toledo	168,497	500	16	207	193	F. Level	5c	Sl. Scale
Dayton	116,577	225	25	72	223	F. Level	6.6c	Sl. Scale
Youngstown.	79,066	125	7	88	161	Hilly	6c	Sl. Scale
Akron	69,067	210	6	81	86	Hilly	5 to 2.5c	
Bucyrus	8,122	None	1	13	10	Level	10c	None

Probably the thought uppermost in the minds of those who have made only a fair showing in this line of effort is that their time and energies have been directed toward obtaining a more profitable class of business. The amount of revenue to be derived from the charging of commercial and pleasure vehicles is an important question. This it is impossible to state absolutely, but a fair estimate, made by averaging a number of cases, rates the pleasure car as a consumer of 104 units per month and the two-ton commercial car, of 500 units per month. This has been expressed in units so that it may be easily applied to any local conditions.

A survey of the business firms, their present transportation facilities, wealth of population, topographical and road conditions of the community served by the central station, will furnish some idea of the possible business in any given territory. It is then up to the central station to determine the amount of money it is willing to spend to obtain this business. This is undoubtedly a local problem and each decision must be based on the merits of the case in question. Having reached this position and determined the approximate amount which is to be expended, whether it be in dollars or a portion of an employe's time, the next thing is a plan of procedure for the central station interested in developing the electric vehicle business.

In making the following suggestions, it is not expected that every central station will see fit to adopt all ideas brought forth; it is only hoped that they will be of assistance to those actively taking up the question.

Some success has been accomplished by the central station taking the agency of some one vehicle manufacturer and directly pushing the sale of electrics; Baltimore, for example. Such a policy undoubtedly has advantages, but these advantages are offset by the fact that it handicaps other manufacturers in obtaining business in that territory. It also means entering a field which is somewhat foreign to that of selling electricity; for example—tire maintenance, battery renewals, general automobile supplies and repair parts. It would seem more advisable, therefore, for the central station to remain neutral as regards the actual make of vehicle sold, leaving the manufacturers, who are presumably the best salesmen of their own product, to fight the sale out amongst themselves, the central station encouraging all to be equally well represented in the territory. This policy should not be carried to the extreme of refusing any assistance or showing any lack of interest, for then an actual loss in opportunities for current sales will result. It is deemed advisable that the central station give this business the same attention it would give a prospective motor purchaser; in other words, have some one man, or group of men, on the lookout for prospective vehicle purchasers, who can furnish to such parties reliable information regarding electric vehicles and put the manufacturer in touch with them. In small towns this duty would fall upon the person who had charge of the new business work. In this connection, the central station battery man can often be of assistance in training the local garage men to take care of batteries and assisting the owner in learning how to properly charge his car. Such a practice may mean regular calls by the battery man on the purchaser of a new car for several months, but it is seldom, if ever, necessary to indefinitely continue such servcie, and it will undoubtedly save many failures of electric vehicles which would tend to retard the increase of their use. To accomplish such work, the men doing it must have some training and information at their command. Ohio men can conveniently obtain this by studying vehicles first hand at the factories at Toledo, Cleveland, Detroit or Pontiac, by writing the manufacturers for data and catalogues, and by studying the operating cost of the vehicles at present in operation in their cities. Ohio is in an advantageous position as regards battery service, as there are several well-equipped battery depots in Cleveland and the men in charge are always ready to go to any reasonable expense in sending experts over the surrounding territory.

Co-operating with garage men and teaching them to properly take care of electric vehicles is certainly of great importance. If satisfactory arrangements cannot be made in this respect, the central station had better take up the charging and garaging themselves, until such time as the business becomes attractive enough from a money-making standpoint to induce garage men to give it careful attention.

After garaging facilities have been provided, it would be well to look around and see if any electric vehicles have been discarded due to the inability of their owners to have them properly taken care of. These cars should be put in use again, if possible, to eliminate adverse criticism of the electric, and prevent gas car salesmen from making sales capital of such examples. After existing local problems have been taken care of, arrangements should be made with vehicle manufacturers to follow up inquiries obtained by power and light solicitors while doing their regular work. This will doubtless involve preparing lists of firms located in a solicitor's territory and getting a report from him on the transportation facilities of each firm.

"The proof of the pudding is in the eating." The central station should set a good example by using the electric car wherever it is practical to do so.

These suggestions point to positive ways in which business can be developed. There is also a negative way—letting it alone unless arrangements are made to properly care for vehicles after being introduced. Much of the prejudice still existing in people's minds against the electric is due to failure of the first cars put on the market, and these failures can, in most cases, be traced to improper selection of the vehicle for the work required and to lack of intelligent care.

Although the current consumed by electric vehicle averages but 20 per cent of the total cost of operation, this item always looms large in the customer's mind. He is more likely to dwell upon it than upon any other item of expense. It is like coal in the cost of steam power and gasoline in the cost of running a motor. It is, therefore, of prime importance that charging rates should seem moderate, not only in the eyes of the truck buyer, but also in the eyes of the truck salesman. His point of view should be taken as nearly as possible, because he must sell his electric product, in competition with horse-drawn and gas-propelled vehicles, on the score of both service and economy. Taking the opinion of truck salesmen as a basis on which to determine a proper charge for current to enable the electric to be successfully sold in competition with horse-drawn and gasoline vehicles, it appears that under a rate of five cents per unit

the pleasure vehicle business will develop readily, while a rate of three cents is required to do as much for the commercial vehicle.

Work of any association committee is apt to be lost sight of unless it is consistently followed up along specific and practical lines. The members of this committee believe that much local investigation can be profitably carried on in this field and suggest that the personnel of the succeeding committee be composed of central station men who have direct charge of the electric vehicle end of their business, men who are managing the transportation department, and representatives of the electric vehicle manufacturers, as the next work of the committee should be preparation of the following data covering standard electric vehicles:

1. Price.
2. Mileage.
3. Speed.
4. Sizes and types.
5. Maker.
6. Cost of operation.
7. Charging information.
8. Battery information.
9. Especial applications of electric vehicles.

In connection with this work the Baker Motor Vehicle Company, of Cleveland, has prepared a plan of tabulating such data which, if studied, might furnish valuable suggestions. Also, the Electric Vehicle Association of America doubtless has a great deal of data on file which might be helpful.

We recommend, as a means of gaining information at first hand, that at least one member of the committee visit the principal vehicle manufacturing plants, study the vehicles and service plans of the manufacturers, and then visit the central stations, explaining to them both vehicles and service of the committee. This, at first, may appear a rather expensive program, but when we consider that the vehicle men of some central stations have undoubtedly visited many of the factories and will probably include others during the coming year, the first part of the expense is almost eliminated. The second part might be covered by the central station bearing part of the expense of the visiting committee member. The experience gained by the committee member in visiting different central stations would undoubtedly increase his value, compensating his company for time spent away from his work.

Development of Car Is Marvelous

New wonders and new conveniences have poured into life so rapidly in the last twenty years that our senses of appreciation has hardly been able to keep up with them. We are getting to accept the most important improvements with comparative indifference and find ourselves so crowded with them that the public, as a whole, fails to realize the advantages for some time after they are available. For example, the electric coupe has been a perfectly practical and an extremely desirable and convenient article for many years, but it is only recently that this fact has received recognition, and a reasonable appreciation shown of the uses and conveniences which no other form of conveyance affords.

Electric coupes of excellent quality and elegant appearance are now obtainable at a price within the range of prices of a popular priced gasoline closed car. This may have something to do with the extension of popular interest, as the extreme economy of maintenance of an electric coupe probably makes a special appeal to those to whom the original purchase price is a matter of consideration and this ought to be almost everybody.

As a matter of fact, we take it as a matter of course. We have become habituated to its appearance on the streets, if not to its use. We know it by reputation, even if we have not experienced its extraordinary convenience, and in consequence we fail to realize what a wonderful thing is an electric coupe.

Eighty years ago the commercial pioneers in the automobile business were objects of ridicule and derision, but today we reward with indifference and accept, as a matter of course, a conveyance which gives us all the comforts of a boudoir with the mobility of a bicycle, in fact, a comfortable little room on wheels, for that after all is what an electric coupe is.

No other form of conveyance affords the user precisely the same freedom of action, convenience and lack of effort that this does. No other conveyance exists which requires no vigor and makes no draft upon the vitality. The operation of driving a well-balanced electric coupe is a rest rather than an exertion. No other form of conveyance year in and year out requires as little consideration when standing on the street in all weathers as this. No other form of conveyance is so little subject to trifling, but effective disarrangements. The care, for example, the charging of the battery of an electric coupe, affords a greater flexibility of treatment than is permitted by the care and operation of any other form of conveyance.

The peculiarities of the electric motor are such that with a reasonably sensible driver and the reasonable use of the brakes, the life of a vehicle far exceeds that of any existing or prospective form of individual passenger conveyance.

All this has been accomplished with no recent startling discovery, no tremendous scientific "jumps" of any kind. The invention of the prototype of the modern storage battery dates back nearly 100 years. Eighteen years ago storage batteries were not expected to drive passenger automobiles over twenty-five miles on a charge. In the ensuing five years this figure was raised to forty as a maximum and today the question of "how much mileage" is practically extinct.

The suitability of the electric passenger automobile to city and suburban service is so complete and its application to it so nearly perfect, with such a large factor of safety, that no one who knows anything about this subject ever asks about the mileage, and if ever this question arises it is taken as prima facie evidence of neglect. Eighteen years ago the battery would sustain little abuse and would scarcely sustain the maximum severity of use. At that time the practical precautions for the care and maintenance of an electric vehicle battery were such as were really practical only for immense central station installations. This has now all disappeared and the experts inform us that with proper periodical provision for a full charge batteries can be charged at convenience, while if the cost of replacements exceeds 2 cents a mile, it is regarded as unquestioned evidence of neglect or abuse, while cases are reported in which these replacements cost less than 1 cent per mile, for a period of years.

But the great advantage lies in its convenience. An electric coupe is perhaps, in proportion to its load, the easiest known conveyance on tires and at the same time is subject to fewer mechanical disarrangements and requires less mechanical attention than seems possible to anyone unfamiliar with it.

Second Annual Outing and Picnic.

E. V. A. and C. G. O. A. Meet at Cedar, Lake Indiana.

CEDAR LAKE, IND., on Wednesday, August 12 staged the second annual outing and picnic of the Chicago Section, Electric Vehicle Association and Chicago Garage Owners' Association.

Cedar Lake has many natural facilities which makes it an ideal spot for such an outing.

Boating, bathing, dancing, fishing and wooded shores include some of the many attractions that are favorable to a real outing.

The majority of those attending traveled to the lake by automobile, having congregated at the Fashion Automobile Station, Chicago, early in the day and thence to the scene of the festivities.

Upon arriving a splendid chicken dinner was served after which a level clear plot in the nearby woods staged the annual championship baseball game between the two organizations. This game yearly serves as the principal attraction. The garage owners this year were successful in defeating the electric vehicle interests. Many of the electric vehicle men account for the result as being influenced by the rooting enthusiasm of some of the brighter lights such as Harry Salvat, Harry Fowler, and Bill Rudd and more so on account of a professional pitcher who was "slipped in as a ringer."

Following the baseball game, foot races for men and women and a broad jump contest excited much interest. Valuable prizes were presented to the winning contestants.

The popular tug of war which is "pulled" each year with Big Bill Rudd as anchor for the garagemen and Walker for the electric interests was won by the garagemen after a hard struggle with old "King Sol" at about 97 degrees.

During the entire day's program a Chicago band "delivered" to the lake on an auto truck played popular airs. Many took advantage of this occasion and devoted their time to the tango, one-step and hesitation. There were sports for all, old and young, and all enjoyed a real outing.

The winners, prices and those donating trophies are listed as follows:

Base Ball Game—Won by the Chicago Garage Owners' Association; 7 innings. Score 6 to 4.

Chicago Garage Owners' Association—Corbett, 2 runs; Browne, catcher, 1 run; Parker; Andrews, pitcher; Kelso; Gibson; Shiffman; Kenney; Morgan, 3 runs.

Electric Vehicle Association—Shannon, 2 runs; Wagner, pitcher; Meissner, catcher; Frayer; Franklin; Pierce; Phillips, 1 run; Freeman; Cressey, 1 run.

50 yard dash—1st, D. B. Parker, Electric Storage Battery Company; 2nd, A. Holland, Edison Storage Battery Company; 3rd, H. B. Phillips, Cutler-Hammer Manufacturing Company. Prizes: 1st, speedometer; 2nd, 6-80 Volkcar Battery Company; 3rd, A. A. electric horn.

Hop, Skip and Jump—1st, I. Anderson, Fifth Avenue Garage, La Grange, 53 feet; 2nd, Kelso, Fashion Auto Station, 47 feet; 3rd J. K. Cole, 5309 Kenwood Avenue. Prizes: 1st, 6-volt Philadelphia battery; 2nd, 6-80 Gould battery; 3rd, Ziskin's Junk Co., prize.

Running Broad Jump—1st, F. O. Linton, 6209 Vernon avenue, Electric Appliance Company, 15 feet, 10 inches; 2nd, Morgan, 533 E. 33rd street, 15 feet, 8 inches; 3rd, E. A. Soutter, Edison Storage Battery Company, 15 feet, 4½ inches. Prizes: 1st, $25.00 Kit of Tools; 2nd, one set Shock Absorber; 3rd, 10 gallons Monogram oil.

One-eighth Mile Swimming Race—1st, G. H. Wells; 2nd, Perry Baldwin, 510 Monadnock Block; 3rd, E. Corbett, Fashion Auto Station. Prizes: 1st, $10.00, Woods Motor Vehicle Company; 2nd, Exide battery 6-80; 3rd, one-half case champagne.

Tug of War—Chicago Garage Owners' Association consisting of Wm. L. Rudd, anchor man, Harry Salvat, J. M. Kealey, Mr. Gibson and Mr. Mausell; Electric Vehicle Association consisting of Geo. Walker, anchor man, Tim Cressey, L. F. Meisner, Lou Wagner and W. J. McDowell. Electric Vehicle Association won the first prize and the Chicago Garage Owners' Association the second and third. Prizes: 1st, McGraw Tire & Rubber Co., one casing, 34x4; ½ barrel oil to each of the other four.

Standing Broad Jump—1st, Morgan; 2nd, Kelso, and 3rd, Andrews. Prizes: 1st, one Empire tire casing; 2nd, Vivax 6-80 battery; 3rd, ½-page advertising in *Traffic World*.

Ladies' Events—25 yard dash was won by 1st, Florence Gibson; 2nd, Gertrude Engel; 3rd, Helen Klitzke and Mrs. Wm. L. Rudd. Prizes: 1st, one percolator; 2nd, one electric iron, Commonwealth Edison Company; 3rd, one electric iron, Metropolitan Electric Company; 4th, one hot water bottle.

Motor Truck Association of Philadelphia

Since its first meeting in April the Motor Truck Association of Philadelphia has greatly increased in numbers and well thought out plans laid down for the various committees this coming fall. The last meeting held was on the evening of June 17 at which all the truck sales companies in Philadelphia, as well as the solid tire and body builders, were represented. Lieutenant William D. Mills, of the traffic squad, outlined the plans of the police department and explained the workings of a new electric signal system which is to be installed at street intersections to control traffic.

City Statistician E. J. Cattell dwelt upon the enormous manufacturing industries of Philadelphia and by citing facts and figures proved the great possibilities for motor transportation in the Quaker city. Mr. Cattell was followed by E. S. Foljambe, of the Motor Truck Club of America. A number of new members were elected and chairman of publicity, entertainment and admission committees were appointed. No meetings will be held during July and August, but the activities of the various committees will nevertheless go forward—these embrace general publicity along educational lines for the good of the industry as a whole, dock and ferry investigation, legal decisions pertaining to the operation and sale of motor trucks, and the development of good fellowship among members with the intent of eliminating the "knocking" of the trade.

PERSONAL AND BUSINESS NOTES.

C. M. Pachman, formerly manager of the Kelly-Springfield Motor Truck Co.'s Kansas City branch, has been made manager of the General Motors Truck Co.'s St. Louis (Mo.) branch.

The Stewart-Warner Speedometer Corporation, Chicago, Ill., has appointed W. C. Knight as its western manager of sales.

R. C. Norberg, assistant general manager of the Willard Storage Battery Co., Cleveland, O., recently sailed for Europe, where he will arrange for the opening of a main branch and the establishment of service stations in some of the larger cities.

Joseph F. Firestone, formerly vice-president of the Columbus Buggy Co., Columbus, O., and later with the Columbus Auto Sales Co., was recently burned to death in a mysterious manner while filling a car with gasoline.

A. H. Dorsey has been appointed manager of sales by the Anderson Electric Car Co. at its Chicago branch, to succeed W. J. Gordon. Mr. Dorsey was formerly connected with the Ontario Motor Car Co., Toronto, Ont.

The Firestone Tire & Rubber Company, Akron, O., is building two additions, 60 by 125 feet and 125 by 140 feet, to its plant, which will increase the floor area about 90,000 square feet. Besides the improvements, a 4,000-kilowatt generator and steam turbine will be installed, and a 70-foot gallery switchboard added.

Nelson B. Hazeltine, formerly Philadelphia sales manager for the Adams-Bagnall Electric Company, has joined the sales organization of the Electric Storage Battery Company at 100 Broadway, New York City.

F. B. Kendall has taken the position as manager of the Firestone Tire & Rubber Co.'s Seattle (Wash.) branch.

The American Carbon & Battery Company has been incorporated at Chicago, Ill., with capital of $250,000, by W. C. Schramm, H. J. Wrape and H. Wrape.

The Liggett Spring & Axle Company has removed its plant from Cleveland, O., to Monongahela, Pa. J. H. Newhart, treasurer of the company, has become general manager, following the resignation of H. R. McMann as vice president and general manager.

Alfred J. Pitts, a well known Detroit newspaper man, has accepted the position of general sales manager for the Wagenhals Motor Car Company of that city.

A quarterly dividend of 1.75 per cent was paid by the Westinghouse Electric & Manufacturing Company on its common stock April 15, and a dividend of 1 per cent on the common stock was paid April 30.

John E. Whitmyer, formerly salesman for the United States Tire Company's branch at Worcester, Mass., has been appointed manager of the company.

George A. Matthews, president of the Jackson Automobile Company, Jackson, Mich., died recently in his private office.

Emil Gruenfeldt, chief engineer of the Baker Motor Vehicle Co., of Cleveland, O., is in Europe on a two months' leave of absence.

L. Pulcher of Detroit has become vice president of the Federal Motor Truck Company, succeeding Garvin Denby, resigned.

Electric Storage Battery Co., Philadelphia, Pa., has declared a dividend of 1 per cent from the company's net earnings on both common and preferred stock, payable July 1, to stockholders on record June 20, 1914.

C. A. Pfeffer of Detroit was recently made secretary as well as treasurer of the Chalmers Motor Company, succeeding Harry Ford, who is now president and general manager of the Saxon Motor Company.

The General Motors Truck Company has appointed H. M. Paine, president of the Paine Automobile Company, superintendent of the service department of its St. Louis (Mo.) branch.

W. G. Tennant has resigned from the vice presidency of the Stewart-Warner Speedometer Company, Chicago, Ill., and will again associate himself with the Tennant Motor Company, of which he was founder.

C. G. Corkhill of St. Louis, Mo., has been appointed by the Haynes Automobile Company as district sales manager for the State of Nebraska.

Assistant general manager is the title of W. O. Rutherford, who for four years has been assistant to H. E. Raymond, second vice president and general sales manager for the B. F. Goodrich Company, his appointment having just been announced.

J. H. Keidler, formerly connected with the General Motors Truck Company and the Northway Motor Company, both of Detroit, Mich., has been appointed general superintendent for the Standard Motor Truck Company's plant in Detroit.

Professor Walter P. Bradley, for twenty-five years professor of chemistry at Wesleyan University, in Middletown, Conn., recently resigned his position to enter the chemical research department of the United States Tire Company.

B. R. Cecil has been recently appointed sales manager of the Standard Car Manufacturing Company of Jackson, Mich.

J. W. Underwood, who was formerly superintendent for the General Motors Truck Company has taken charge as manager for the Warren Garage and Rental Company, a joint gasoline and electric garage at 4921 Delmar Boulevard, St. Louis, Mo. The officers of this company are M. W. Ruckle, president; W. C. Siebens, vice president, and J. H. Wolf, secretary. The company is to take an agency for a pleasure car, in addition to conducting the garage. A portion of the premises are occupied by the Standard Electric Car Sales Company, occupying the quarters recently vacated by the Rauch & Lang St. Louis Company, now at 3120 Locust Street.

Electrics for Bakers

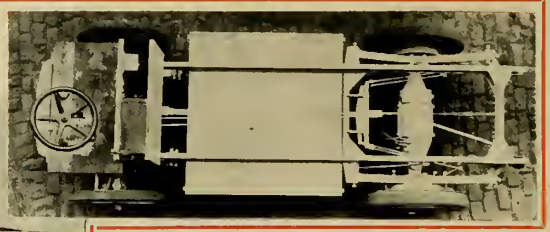
According to *The Power Wagon,* which has just completed a census, there are 1,819 automobiles, representing an investment of close to five million dollars, in the service of 561 bakers throughout the country. Most of the large fleets are mixed, that is, both the gasoline and electric types are used, each in its field, and while the electrics are outnumbered in the total, 786 to 1,033, the storage battery vehicle predominates among the lighter vehicles, which are more popular for route work. There are 406 machines rated under 1,000 pounds capacity, and of these 338 are electric. These are the wagons that perform the bulk of the store-to-store delivery, the heavy types being used principally for the transportation of large shipments.

The Parcel Post and Electric-Vehicle Delivery

To central-station executives in the fifty largest cities of the United States the committee on parcel-post delivery of the Electric Vehicle Association of America, of which James H. McGraw is chairman, has sent detailed data showing the magnitude of the parcel-post traffic in each such city for a recent fifteen-day period. The combined figures for the fifty cities (which have a total population of over 25,000,000) show that nearly 11,000,000 parcels were mailed out from these fifty post offices during the interval from Oct. 1 to Oct. 15, 1913, while 3,500,000 parcels were received for local delivery during the same period. The average weight per parcel was 1 lb. 11 oz., and the average postage paid per parcel was 10 cents. Almost three-quarters of the total number of parcels handled were delivered by regular carriers without additional expense, while about 350,000 parcels (approximately 10 per cent) were handled by automobiles of one kind or another, at a total cost of $17,653, or about 5 cents per parcel. In the fifty cities for which figures were obtained one inhabitant in every seven received a package through the parcel-post service during the two-week period named. Besides the work already referred to, the committee is going ahead and collecting additional data on parcel delivery, the dates on which local transportation contracts expire, and the disposition of the local post office authorities toward the utilization of electric vehicles in the service.

The present design of the electric, with its advancement in construction, should satisfy almost every motorist. If motor car owners realized that they could use electrics for their needs 300 days out of the year (presuming they could afford the other 65 days for touring) for at least half the price they would most assuredly adopt the electric.

New Models of
WALKER ELECTRIC VEHICLE



This style chases can be furnished in any capacity from 1,000 lbs. to 8,000 lbs.

WALKER VEHICLES should be investigated by every user of Commercial Vehicles. At least 75% of all city and suburban hauling and delivering can be done more economically and satisfactorily by Walker Electrics than by horse or gasoline vehicles, especially when stops are frequent.

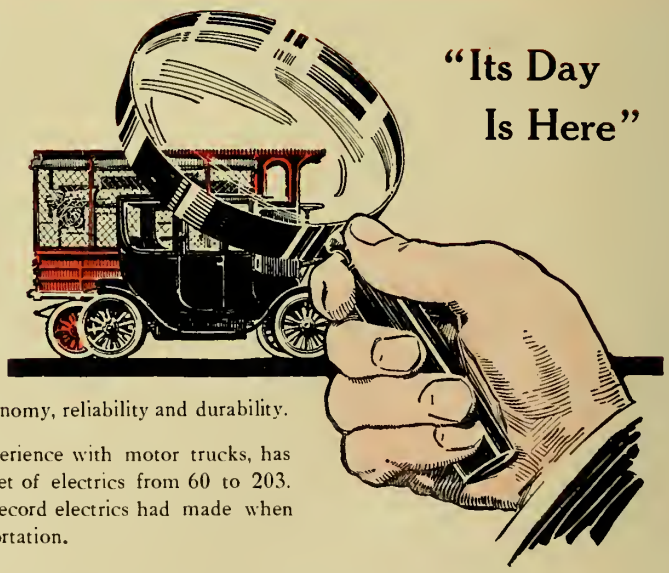
Walker Electrics have a greater mileage capacity per day than the driver and the helper on all city work. Let us know your service conditions and we will tell you frankly whether it will pay you to use Electrics.

WALKER VEHICLE COMPANY
CHICAGO

More Walker Electric Vehicles have been sold in Chicago than any other make of either Gasoline or Electric Vehicle.

398

INVESTIGATE THE ELECTRIC



"Its Day Is Here"

TWO-THIRDS of the gasoline trucks in service today will be replaced by electrics; this is the statement of a transportation expert.

The man who half investigates and buys gasoline trucks will be forced by economy or competition to change to electrics. This is expensive and unnecessary, especially in view of the record made by electrics as to economy, reliability and durability.

One large Chicago firm of fourteen years experience with motor trucks, has in the last eighteen months increased their fleet of electrics from 60 to 203. This addition was made *only* because of the record electrics had made when compared with their other methods of transportation.

Whether you own one horse and wagon or a fleet of gasoline trucks — you should investigate the electric.

Our Vehicle Engineers are at the service of Chicago firms.

Commonwealth Edison Company
120 West Madison Street : : : Chicago

398A

ELECTRIC VEHICLES

Vol. 5 CHICAGO, SEPTEMBER, 1914 No. 3

MRS. O. G. TEMME AND HER NEW DETROIT ELECTRIC


EMC
ESTABLISHED 1907
PUBLISHER
TECHNICAL MAGAZINES
AND TECHNICAL BOOKS

Published Monthly By
ELECTRICITY MAGAZINE CORPORATION
Monadnock Building
CHICAGO

Entered at Chicago Post Office as Second Class Mail Matter

ELECTRIC VEHICLES
WITH WHICH IS INCORPORATED IGNITION
TRADE MARK REGISTERED IN THE UNITED STATES PATENT OFFICE

SUBSCRIPTION PRICE
Domestic - $1.50
Canada - - $1.75
Foreign - - $2.00

FOR SALE AT ALL NEWS STANDS

If Your News Dealer Will Not Supply You—Please Notify Us

Volume V | CHICAGO, SEPTEMBER, 1914 | Number 3

The Influence of the Efficient Branch Office

Opportunities Which the Anderson Electric Car Company Has Taken Advantage of in Chicago

BY FRED B. SCHAFER

SIX years ago the Anderson Electric Car Company, Detroit, Mich., builder of "Detroit electrics," conceived the idea that Chicago was topographically ideal for electric vehicle service. Level well paved streets, excellent charging facilities, comparatively low charging rates, together with a type of people ready at all times to try out any new product predicting economy, caused this company to establish a branch office from which Detroit electrics could be introduced to the general public.

The first twelve months, as the executives of the company expected concluded with but fair results. Electrics were exceedingly hard to sell and the public throughout the country was quite slow in becoming educated to the value of this type of vehicle. However, year after year brought out new models and the vehicles already on the street were attracting considerable attention.

At this time Chicago already had an electric vehicle manufacturer and it was but natural that the greater percentage of vehicle purchases were obtained from the home concern.

D. E. Whipple, Chicago Manager.

During the early stages of electric vehicle building, all models were constructed practically after the same design. However in the course of the next few years designs changed. The entire construction of the vehicle underwent a complete development. The lines of the body were made more graceful, the interior fixtures more luxurious, and the mechanical factors simplified and strengthened for durability.

On account of these changes, prospective purchasers found it necessary to inspect all types before choosing. Because of this new condition which regulated vehicle sales, manufacturers at once began to develop their models in order to produce the most attractive vehicle, offering special inducements, thereby promoting competition.

The Anderson Electric Car Company was quick to discover the element which was instrumental in creating sales, and consequently produced a vehicle which was as nearly mechanically and artistically perfect as possible. These models were attractive both in exterior and interior appearance. The material used in the construction of the car was tested and all proved satisfactory. The engineers had figured out the best possible arrangement of the mechanical factors and in fact the vehicle was a "parlor on wheels," that lived up to its guarantee.

Three years ago the Anderson Company realized that Chicago was an exceptionally good field in which to market the electric. With the intention of gaining a stronger hold in a city which has since proven to be the second greatest electric vehicle center in the world, the company's executives sent D. E. Whipple, who at once secured a competent staff capable of interesting the general Chicago public in Detroit electrics.

Under his management the Chicago branch has become an important member in the parent organization.

The branch located at 2416 Michigan avenue is well equipped and represents over a quarter-million dollar investment. The building itself is two stories in height, contains salesroom, inspection department, and a complete repair and battery department. Each department has a manager and an efficient staff.

The inspection department inspects all vehicles regularly and a report is sent to the owner with a duplicate report to the company. Any minor repairs which should be made are suggested to the owner and the cost estimated.

The repair department is equipped with modern facilities capable of making any repairs on a Detroit electric, and in fact equipped efficiently enough to build a complete vehicle. Service wagons are ready at all times to carry parts to damaged electrics or to bring vehicles into the shop for repairs. A man direct from the factory is at the head of this department and is thoroughly acquainted with every part and every method in the manufacture of Detroit electrics. This department also maintains a corps of traveling mechanics whose duty as near as possible is to call upon Detroit electric owners and give any needed assistance or instruction necessary. In this way the Chicago office has gained a country-wide reputation taking care of its cars after they are in the owners' hands. Each

year develops so many converts to the electric that this branch has instituted a department known as the used car department. This department considers all gas vehicles or electrics to be taken in exchange for new Detroits and likewise through its three salesmen, disposes of the vehicles so taken, both gas and electric.

The new car sales department supervised by the sales manager, George R. Veeder, at the head of a staff of salesmen averaging eight to ten men, is responsible for the gerat number of this individual manufacturer's electrics sold in Chicago each year by this one representative branch. This sales staff is composed of more than mere salesmen—men who have obtained a mechanical knowledge of the cars which they are selling. It is the policy of these salesmen to sell their vehicles purely on their merit.

Many Detroit electrics have been sold in Chicago and most probably because of the value in their mechanical features.

The company's policy is to build its vehicles entirely in its own shops. It is interesting to note a few of the principal elements which enter into the construction of these vehicles.

The chassis for instance is produced entirely by the Anderson Electric Car Company in their own plant, all parts are of their own design and each part is made under their careful supervision; exactly suited for co-operation with all other parts to which it bears any working relation. Materials are of the highest grade, the finest of steels, nickel, vanadium and other alloys are used. This being determined in each individual case by scientific analysis of the work which the part is required to perform. Each chassis part is tested thoroughly for strength, durability and accuracy. Bearings of the highest quality throughout the chassis guarantee a hundred per cent factor of safety and insure long life and a minimum of inconvenience. Drop forgings are used wherever it is possible.

Bushings are used throughout the chassis. Consequently the life is practically unlimited as the bushings take all the wear on friction exposed surfaces and can be easily and economically replaced whenever it becomes necessary.

The famous Lanchester-Daimler worm gear has been adopted on all Detroit electrics. Mounded at the bottom of the axle below the ring gear, the worm gear continually runs in a bath of oil. Under a condition where through continued service the oil level and the gear housing is allowed to fall below normal, the possibility of sufficient lubrication is much greater with the worm mounted below the worm gear than any other design of mounting. This gear is efficient, silent, and perfectly smooth in operation.

Among the many mechanical features which have contributed to the universal success of the Detroit Electric, none ranks higher in importance than the "chainless" direct shaft drive. The results secured from this type of construction is the application, at the rear wheels, of the highest possible percentage of the power delivered by the battery to the motor. Some types of electric vehicles employ a motor which normally operates at a speed of approximately 1,600 revolutions per minute. In order to transmit battery power through such a motor and drive the rear wheels at proper normal speed, power-wasting speed reduction methods are required. In some cases a pinion gear on an extension of the motor shaft reduces its speed into a rear axle bevel gear of a very large and unwieldy size, resulting in heavy wear, noisy operation and frequent adjustments. In other cases, a single chain drive is used between the motor and propeller shaft, which latter is then geared to the rear axle in the usual manner. Sometimes the last method is reversed, the motor shaft being extended to a point near the rear axle and then connected by chain to another stub shaft driving the usual rear gear system. This method also introduces noisy operation and constant adjustment of chains, gears, etc., to secure results which are even passably satisfactory. The inevitable result in each case is a loss of valuable battery power dissipated in friction —power which could otherwise be employed in exercising its intended function of driving the car.

The Anderson Company's construction is made possible by the Detroit electric motor. This motor is designed and built in their own factory to operate at a speed of 800 revolutions per minute for the bevel gears, or of 1,000 revolutions for the worm gears. This speed requires reduction only once between the motor and rear system and is so reduced by the gears at the rear axle of perfectly normal size and specifications. A motor of this type has many other advantages. Being necessarily larger, its wiring and other parts can be built up in such a way as to enable it to withstand sudden or long overloads without excessive heating—a most desirable feature in a vehicle motor. However, this construction in no way increases the total weight of the power plant because the elimination of chains, extra gears, housings, etc., more than offsets the relatively slight increase in motor weight.

Connection between motor shaft and propellor shaft is through a universal joint. All parts of the cross in this joint are hardened drop forgings ground to a perfect fit. When the car is loaded, the motor and driving shafts assume a position in a straight line, the purpose of the joint being simply to act when the car travels over uneven surfaces, etc.

The propeller shaft, pinion gear and its shaft are all of chrome nickel and vanadium steel and are entirely enclosed in a pressed steel housing of neat design. The pinion gear and its shaft are integral, the whole piece being connected to the propeller shaft by means of a square drive. Motor and shafts all travel on ball-bearings of liberal size, reducing friction to a minimum.

In painting Detroit electrics only the highest qualities of materials—rough stuffs, colors and varnishes are employed. Each car requires twelve to fifteen weeks in their paint department, giving sufficient time between each operation for thorough drying. This guarantees a hard and brilliant finish. This pleasing appearance has always been conceded as one of the winning features of the electric storage battery propelled vehicle.

"Quality first" is the motto, and this company claims it has secured maximum quality through the improved methods of up-to-date quantity production.

The Chicago branch sales staff are energetic and enthusiastic in the belief that the electric is the answer to transportation. This absolute faith and confidence in their product has been responsible for a yearly increase in sales.

During the year beginning August, 1913, and ending August, 1914, two hundred and ninety-one new and used cars were sold by this branch alone. It is stated that the sales for this year will be still increased.

The record made by this branch office is a good example of what the electric vehicle industry really offers. The electric is a legitimate purchase—durable, efficient and economical. Energetic and enthusiastic sales forces such as this branch office employs will in the very near future place the electric permanently before the public at large. Upon just such representatives depends the rapid success of the electric vehicle.

The Responsibilities of Spring Making

A Glimpse Into the Experience, Scientific Work, Special Materials and Processes of Spring Making

BY A. T. HIGG

IT is the common opinion among people not familiar with the manufacture of springs, or their design, that springs are of standard types and kept in stock by manufacturers, and, therefore, can be supplied in quantities to fit all cars of similar types. This is entirely incorrect. Every car should have the springs specially constructed, as it is a matter of experiment and test to arrive at the best design, with a view to furnishing perfect riding qualities and safety.

Few owners realize to what a large extent this element of safety is dependent upon proper suspension. If they remembered that the entire car, except the axles, rests upon the springs, and that everyday comfort and safety is actually dependent upon the strength and riding qualities of these supporting leaves of steel, they would undoubtedly be convinced that this important part of the equipment is worth the most careful investigation and study.

Springs are apt to be improperly designed for the car they are required to support, or if they are properly designed, they may be improperly put on. Either of these conditions may cause breakage, and a broken spring is frequently the cause of a serious accident.

Entirely apart from the questions of comfort and safety is the question of durability, also dependent on springs. Imagine the wear and tear on the delicate mechanism of a car equipped with improperly designed or carelessly made springs—springs that because of their misfit, act as conductors rather than absorbers of the shocks encountered on rough roads.

The car owner, because he does not know that the right kind of springs can be supplied at a slight additional cost over an inferior article, often considers better-grade springs as a luxury rather than a necessity.

Even the dealer may not fully appreciate the vast improvement that a slight additional investment will secure. Some dealers are so misguided as to deflate their tires to give the effect of easy riding springs because they know that with the proper inflation of the tires, the stiff ready-made springs with which the car is equipped will make it ride hard, which detracts materially from the comfort of its passengers.

Owners and dealers who insist upon good springs find many arguments which bear weight with the manufacturer. Good springs are a real economy for the builder of cars, because by their use he saves the expenses and trouble of replacing breakage and springs that have settled. The cost of such accidents falls more heavily on the manufacturer through loss of reputation than through the actual cost of the replacement.

Partial View of Detroit Steel Products Company's Plant, Detroit, Mich.

A glance at the mechanical side of spring building reveals a host of little details which the owner, dealer and manufacturer will find it advantageous to keep in mind.

For instance, in the form of construction known as the Hotchkiss Driver, the rear springs assume the office of radius rods and torque tubes, and are the only connection between the rear axle and the chassis, with the exception of the propeller shaft which is coupled up by universal joints. If one of these members should fail, a very severe accident might occur as there is nothing else to keep the axle in line.

It should be kept in mind that springs which are properly made and designed come down to a straight

line under severe conditions. Clearances between the axle and the striking point should be large to allow ample deflections. This gives soft riding and hence, easy riding. The maximum amount of easy riding that can be secured in any given car can be definitely predetermined by the spring designer who makes a study of the car construction, and the proportion of weight to be carried.

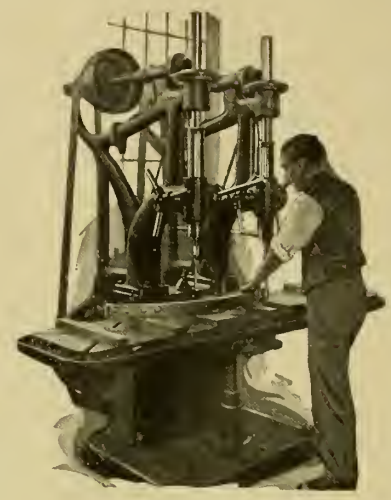
The best springs are long, low and flat, and should have ample width to prevent the side sway which causes excessive stresses in the material. They should be fastened to the axle by large sized axle clips, because breakage often occurs at this point if the spring leaves are not held tightly together.

Not everybody knows why an automobile spring is divided unequally, that is, why there is greater length of spring on one side of the suspension point than there is on the other. The reason is that a properly riding car practically pivots on its front axle. On this account the rear end of the front spring should always be somewhat longer than the front end. The same also applies to the rear springs. If is a three-fourths elliptic spring is used, the additional action on the rear end is obtained in the scroll part. In the platform type, the additional action is secured by the cross spring and the semi-elliptic spring is divided out of center the same as on the front spring.

It is very desirable that the front springs should not be parallel to the road, but that the rear end be placed nearer the road than the front end. This sets the spring against the road and allows it to absorb part of the horizontal component of the road shock. If this is not done, the road shock is transmitted lengthwise through the spring to the frame, giving a very disagreeable effect. Road shocks will also cause cracking of paint and working of the body which eventually causes rattle.

The reliable manufacturer considers all these points carefully in the equipping of every car. In fact, these are only a few of the fine points required in springs that are properly designed for the burden to which they will be subjected.

The foundation of a well made spring lies in the selection of proper material to meet the particular stress it will have to carry. When inferior material is used, rigidity and bulk are necessary because of the low elastic limits which will not permit of large deflections.



"Reaming" to 1/1000th inch.

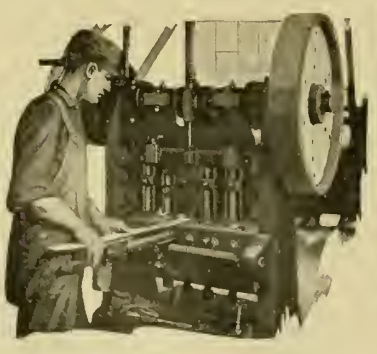
The idea that alloy steel will give a better ride than a carbon steel provided the deflections remain the same in the springs, is erroneous. The advantage of alloy steel over carbon lies in its enduring qualities because of its high elastic limit which allows greater deflection.

Of next importance to the selection of good material is the machining of the different elements to make up a unit which will give the desired deflections on which so much depends. Every blade should be of proper thickness and have a proper taper at the ends and all should be held securely together at the center after the final fitting of the individual leaves.

Here it might be added that on a properly made spring every individual leaf is fitted to the leaf below it, and one leaf out of one spring will not fit in the corresponding place in another spring of exactly the same design.

The eyes in the end of the springs must be absolutely true and at right angles to the length of the spring. If these are not true, great wear will occur at one part of the eye and this will wear out the bushing or the bolt and cause rattle in a very short time. It is also necessary that the width of the eye be faced to the exact size required. "Knocking" is thus prevented because there is no play between the shackle and the spring.

The center construction of a spring should be so designed as to eliminate weakness. A center bolt through a spring is undesirable because, to put in a center bolt, it is necessary to take out the metal to make the hole. This weakens the spring where the greatest stress occurs, therefore, it is much more desirable to form the



Trimming Ends of Leaves.

"Tapering" Individual Spring Leaves.

Polishing Springs.

metal into a sort of nib on each leaf. In the assembled spring, one nib rests within another, giving additional strength at this heavily stressed point.

Perhaps the greatest difficulty and cause of greatest trouble with springs lies in improperly heat-treating the material after all the machining and shaping operations are complete. It is very essential that steel be heated to an exact temperature before quenching, otherwise, the different leaves have varying hardness and internal structure. It is most important that this structure be fine and fibrous as the coarse structures are lacking in resisting qualities.

After the leaves have been hardened at the proper temperature, the temper is drawn back into the leaves to secure the proper toughness and this is also a very delicate operation. The greatest care possible must be exercised in seeing that these heats are neither too high nor too low, for if the temper is drawn too much the spring will settle or take a permanent set and, if it is not drawn enough, the spring will be too hard and will break.

After each part has been thoroughly tested to see that the proper hardness exists, the leaves should be given a high polish so that when lubricated, they will slide readily on each other. If the leaves are allowed to bind a harsh action will result.

But is must not be imagined that springs however carefully constructed will remain in perfect condition always without further care or attention. A certain responsibility devolves on the car owner, if he expects his springs to give him maximum service. Occasionally the axle clips must be tightened; the grease cups on the spring end bolts must be kept filled and the tires must be inflated to proper pressure. A few simple precautions such as these will insure to car owner, dealer and manufacturer the satisfaction which comes from a product conscientiously made and intelligently used.

E. V. A. Convention Committee

The following committees have been appointed to carry out the program of the Fifth Annual Convention of the Electric Vehicle Association of America to be held at Philadelphia, October 19, 20 and 21.

General Convention Committee.—Chairman, Joseph B. McCall, president, the Philadelphia Electric Company, 1000 Chestnut street, Philadelphia, Pa.; W. C. L. Eglin, second vice-president, the Philadelphia Electric Company; R. L. Lloyd, Electric Vehicle Department, the Philadelphia Electric Company; J. Crawford Bartlett, proprietor Bartlett Garage, 11 North Twenty-first street, Philadelphia, Pa.; Stephen G. Thompson, Public Service Electric Company, 57 Clinton avenue, Jersey City, N. J.; William H. Metcalf, sales manager, Woods Electric, 17 North Twenty-first street, Philadelphia, Pa.; William A. Manwaring, superintendent transportation, the Philadelphia Electric Company, 1208 North Thirty-first street, Philadelphia, Pa.; Percy H. Bartlett, superintendent meter department, the Philadelphia Electric Company, 10000 Chestnut street, Philadelphia. Pa.; Carroll A. Haines, proprietor, Park Garage, 2214 Spring Garden street, Philadelphia, Pa.; Fred B. Neely, Electric Storage Battery Company, Nineteenth and Allegheny avenue, Philadelphia, Pa.; A. W. Young, Public Service Electric Company, 418 Federal street, Camden, N. J.; E. R. Whitney, Commercial Truck Company of America, Twenty-seventh and Brown streets, Philadelphia, Pa.; R. L. Heberling, Philadelphia Storage Battery Company, Ontario and C streets, Philadelphia, Pa.; George B. Muth, the Philadelphia Electric Company, 1000 Chestnut street, Philadelphia, Pa.; W. H. Johnson, vice-president, the Philadelphia Electric Company, 1000 Chestnut street, Philadelphia, Pa.

Out-of-town Members.—W. A. Donkin, 435 Sixth avenue, Pittsburgh, Pa.; Richard H. Young, Public Service Electric Company, Newark, N. J.; Harvey Robinson, New York Edison Company, Irving place and Fifteenth street, New York, N. Y.; Stanley Walton, Pacific Gas & Electric Company, San Francisco, Cal.; W. W. Freeman, Union Gas & Electric Company, Cincinnati, O.; E. S. Marlow, Potomac Electric Power Company, Washington, D. C.; Day Baker, 84 State street, Boston, Mass.; E. S. Mansfield, Edison Electric Illuminating Company, Boston, Mass.; Arthur Williams, New York Edison Company, 130 East Fifteenth street, New York, N. Y.; Homer Neisz, Commonwealth Edison Company, Chicago, Ill.

Entertoinment Committee.—Chairman, J. Crawford Bartlett; Charles Blizard, E. S. Hare, John Meyer, Washington Devereux, Frank S. Marr.

Ladies.—Mrs. J, B. McCall, Mrs. R. L. Lloyd, Mrs. A. W. Young, Mrs. F. B. Neely, Mrs. Homer E. Niesz, Mrs. J. Crawford Bartlett.

Finance Committee.—Chairman, W. H. Johnson; William G. Bee.

Publicity Committee.—Chairman, W. H. Metcalf; H. C. Cushing, Jr., R. L. Heberling, H. K. Mohr, C. A. Musselman.

Transportation Committee.—Chairman, W. A. Manwaring; J. C. Bartlett, F. E. Whitney, F. N. Carle, William H. Clegg, Hal C. Smith, J. A. Jacques, James F. Rogan, F. E. McCall, P. H. Kemble, Charles H. Miles.

Exhibition Committee.—Chairman, Percy H. Bartlett; C. A. Stimpson, W. H. Metcalf, M. E. Arnold, George L. Thompson, William H. Patton, G. O. Simpson, F. M. Shepard.

Program Committee.—Chairman, R. L. Lloyd; J. C. Bartlett, H. K. Mohr.

Toronto Announces New Charging Rates

The Toronto Electric Light Company, Ltd., announces a new schedule of electric vehicle charging rates, which is as follows:

A service charge of one dollar and thirty-five cents ($1.35) per horsepower of maximum demand per month, plus a charge of two and a half cents per kwh. for the first fifty hours monthly use of the maximum demand, plus three-quarters of a cent per kwh. for all excess current consumed in any one month, the gross bill being subject to a prompt payment discount of ten per cent. This is for 115/230 volt direct current, which is distributed in a limited section near the center of the city. As regards the alternating current, the rates are similar, but differ in the primary and tertiary charges for the energy consumed. This schedule is as follows:

A service charge of one dollar and thirty-five cents per horsepower of maximum demand per month, plus one and a half cents per kwh. for the first fifty hours monthly use of the maximum demand, plus one-half cent per kwh. for all excess current consumed in any one month, the gross bill being subject to a prompt payment discount of ten per cent.

There are in use at the present time in the city of Toronto, approximately one hundred and fifty (150) pleasure electric vehicles and thirty commercial electric trucks, which according to all reports have proven very satisfactory.

The electric vehicle is just coming into its own in the Dominion of Canada and there awaits a very fertile field for the development, which American manufacturers are expected to take advantage of.

Spokane Tests Electrics

The Beardmore Transfer Company, of Spokane, Washington, has purchased a two-ton electric automobile truck from the Washington Water Power Company to be used in its transfer business. The piece of equipment cost $2,300. The Pacific Transfer Company recently bought a one-ton truck, the price being $1,962. The sales were made through M. C. Osborn, commercial agent for the Washington Water Power Company.

Electric Vehicle Division, S. A. E. Progress Report

Society of Automobile Engineers Decides on Originating Electric Vehicle Standardization Work

BY ARTHUR J. SLADE

THE first meeting of the electric vehicle division of the Society of Automobile Engineers was held at the headquarters of the society on April 8, 1914. A number of members of the standardization committee of the Electric Vehicle Association of America were in attendance and an extended informal discussion was had as to relations between the E.V.A. committee which has been established for a number of years and has a large volume of work under way in addition to having already adopted certain standards, and the newly appointed S.A.E. committee. Pertinent comments were also made on the fact that the electric vehicle industry was not represented on several divisions of the S.A.E. standards committee, the work of which should not be confined to standardization with reference to gasoline vehicles only, and to the fact also that several divisions bore titles likely to cause confusion of mind since the appointment of this new electric vehicle division, notably the motor testing division which has to do solely with internal combustion engines, and the electric equipment division which has to do solely with electric equipment on gasoline cars.

Agreement was reached to hold a second meeting before the mid-summer S.A.E. meeting after the selection of a chairman by mail vote, at which meeting the division should permanently organize and take up any matters which might come before it, especially the work being carried on by the E.V.A.

The second meeting was held at the society's headquarters on June 2, the Electric Vehicle Association again being represented by several members, and a representative of the National Automobile Chamber of Commerce also being in attendance. The decision was reached that it was highly desirable that the S.A.E. division should include in its membership all of the E.V.A. committee members who are also S.A.E. members and the council at its last meeting has considerately met our views in this matter, at the same time making some other slight changes in the committee personnel which is now constituted as follows:

Arthur J. Slade, consulting engineer (chairman); J. R. C. Armstrong, chief electrical engineer, General Vehicle Co.; H. S. Baldwin, engineer, General Electric Company; E. J. Bartlett, assistant sales manager truck department, Baker Motor Vehicle Co.; J. R. Coleman, chief engineer, Atterbury Motor Car Co.; W. H. Conant, Detroit manager, Gould Storage Battery Co.; R. S. Fend, chief engineer, Woods Motor Vehicle Co.; Bruce Ford, fourth vice-president, Electric Storage Battery Co.; John H. Hertner, mechanical engineer, Rauch & Lang Carriage Co.; Walter E. Holland, research engineer, Anderson Electric Car Co.; Benjamin Jerome, chief draftsman and engineer, Couple Gear Freight Wheel Co.; H. H. Kennedy, chief engineer, The Waverly Co.; William P. Kennedy, consulting engineer; Ernest Lunn, president, Walker Vehicle Co.; E. J. Ross, Jr., manager sales engineering department, Edison Storage Battery Co.; T. H. Schoepf, general engineer, Westinghouse Electric & Manufacturing Co.; W. J. B. Thomas, chief engineer, Century Electric Car Co.; C. A. Ward, secretary and treasurer, Ward Motor Vehicle Co.; E. R. Whitney, chief engineer, Commercial Truck Co. of America; F. A. Whitten, chief engineer, General Motors Truck Co.; G. W. Wesley, vice-president, General Vehicle Co.

This committee is thoroughly representative of all electric vehicle engineering interests.

In view of the sentiment of the committee that the S.A.E. should originate electric vehicle standardization work rather than the E.V.A., E. R. Whitney, chairman of the standards committee of the latter, proposed to recommend to the president and the board of directors of that association that the records and other results of its valuable work extending over a period of years be transferred to the S.A.E. electric vehicle division, and we report with pleasure that favorable action was taken on this matter at a meeting on June 19, so that the society can now proceed with its standardization work with the advantage of both the records and the personnel of the E.V.A. standardization committee.

In addition to the large volume of data on subjects under investigation by the E.V.A., standards already adopted by the National Automobile Chamber of Commerce, also data on batteries referred by the data sheet division, and subjects submitted by the division members were laid before the committee and the decision was reached to appoint five sub-committees to which all these matters could be referred. The following sub-committees were therefore created:

Motors and Controllers:—W. E. Holland, chairman; H. S. Baldwin, T. H. Schoepf.

Batteries, Wiring and Charging Appliances:—G. W. Wesley, chairman; Bruce Ford, E. J. Ross, Jr., W. H. Conant, E. R. Whitney.

Lamps:—R. S. Fend, chairman; Ernest Lunn, Benjamin Jerome.

Speed and Mileage Ratings:—F. A. Whitten, chairman; E. J. Bartlett, William P. Kennedy.

Tires:—E. R. Whitney, chairman; J. H. Hertner, F. A. Whitten.

To these sub-committees will be forwarded the data at present on hand from all sources, and it is expected by this means prompter action can be taken on given subjects than would be otherwise possible.

In view of the fact that the following divisions of the S.A.E. standards committee do not comprise in their membership any electric vehicle engineers, this division desires that the council give consideration to the desirability of appointing at least one electric vehicle engineer to each of the following divisions when favorable occasion offers:

Ball and Roller Bearings, Frame Sections, Nomenclature, Pleasure Car Wheels, and Springs.

Standardization on these subjects is equally of interest to the electric vehicle engineer and the gasoline vehicle engineer.

The interest of the members of this division is very marked, and it is confidently expected that reports on both standards and recommended practice which will prove to be of value to the society and the electric vehicle industry will be the result of its work.

Determining Operating Costs

A Treatise on the Value of an Accurate Record Showing Mileage, Speed and Stops Made

BY F. DUCASSE

OPERATORS of motor-driven commercial vehicles, either small or large, are confronted with the necessity of both determining operating costs and minimizing them. As a vastly greater amount of work is possible with motor-driven vehicles over horse-drawn, it follows of necessity that they operate faster, and owing to this fact, the risk over horse-drawn vehicles is increased and must be controlled. All costs of operation must be based, therefore, on mileage and speed, and these two items must be controlled, as must also the time of stops, to guarantee the highest efficiency.

For years commercial vehicle operators have not given the proper thought and attention to equipping reliable recording instruments to their vehicles, but to continue along these lines is not only careless but spells inefficiency.

It is a fact that up to within a few years ago, the majority of recording instruments were unreliable. The American Taximeter Company, New York City, is specializing in efficiency-guaranteeing recording instruments for commercial vehicle users, manufacturing a tape-recording device, the Recordograf, a hub odometer, the Transimeter, and two types of taximeters.

"Dreadnought" Transimeter.

the general use of the recording instrument vehicles.

The Transimeter has been made to fill a long felt want in the operation of commercial vehicles. Many hub odometers have been presented to the public that have been inefficient and lacking in the qualities essential to successful and accurate registration of the mileage traveled by the vehicle.

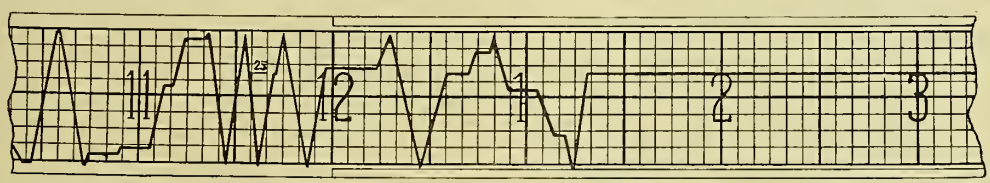
The Transimeter is a slow speed instrument which has been designed to withstand any shock and all vibration. It is self-contained, has no frail parts, absorbs no power, is distinctly light and noiseless.

The instrument is manufactured in two types—one known as the "Dreadnought" type, which is incorporated in a hub-cap, the instrument being used to replace the hub-cap of the vehicle. This type is guaranteed for the life of the vehicle to which it is attached absolutely against destruction. A second type, which contains all of the wonderful features found in the Transimeter, and which is very strong, known as "Type XX," can be applied to absolutely any hub-cap.

The counting mechanism is housed in a malleable iron or bronze casting of sloping external walls ¼ inch in thickness. Wide air space separates these walls from the counting mechanism and affords it complete protection from external injury.

The counter is at the end of the hub-cap and the mileage covered can always be easily read.

This type is recommended for all heavy trucks.

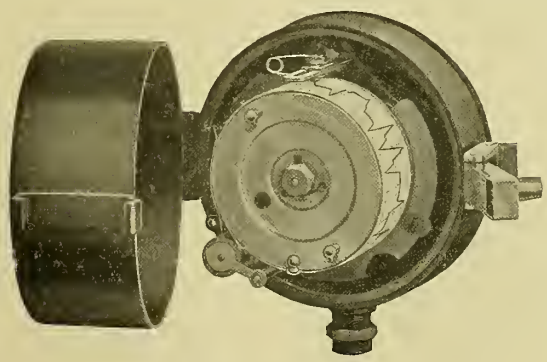


Tape Showing Vehicle Operation.

With the advent of the products of the American Taximeter Company, whose by-word is "Accuracy always," the operator can be assured of a minimum of trouble from this source. The firm maintains service stations throughout America, and its particular aim has been at all times to furnish simple, accurate and effective recording instruments.

Recording instrument construction is an art and a specialty, particularly where heavy service trucks are involved. The present popularity of taxicabs is due to the efficiency of the taximeters around which the taxicab business in America has been built.

Efficiency in the business of delivery with motor-driven vehicles has grown in popularity with



The Tape Recordograf.

The salient features of this instrument are:

1. The mileage record is found in the center of the hub-cap and is protected by a double, counter-sunk plate glass, this construction affording the greatest protection to the record.
2. The instrument is dust-proof and grease-proof.
3. The mileage record remains at all times horizontal.
4. The mileage will record whether the vehicle moves forward or back-

ward, and of course at all speeds.

5. The record has a scope up to 9999.9 miles, whereupon it mechanically resets to zero.

6. The method of transmitting power to the instrument is positive and therefore accurate. A small steel pin is inserted in the end of the spindle. The instrument is then attached to the hub after the manner of a hub-cap.

Those having had hub odometer experience are bound to recognize that the features of the Transimeter eliminate the shortcomings of many other types of hub odometers.

THE RECORDOGRAF.

This instrument, which records on a paper tape each day's operation of the vehicle to which it is attached, gives an absolute, accurate record of every movement or lack of movement; time, distance, speed and stops.

The Taximeter.

Attachment is possible to any description of vehicle by means of a very slow speed flexible shaft transmission. The flexible shaft is actuated by an eccentric collar and 10-tooth star, which are attached to one of the front wheels. The gear transmission commonly used on speedometers is not utilized. The speed of the flexible shaft on a 32 inch wheel is 60 revolutions to the mile. Owing to the sturdy construction of the transmission and the slow moving parts, it will wear almost indefinitely and keep in running condition.

The instrument consists of a circular box, in which is found the mechanism. This mechanism consists of a worm shaft, a worm gear, a pencil-holder, and a very high-grade clock which winds up the tape.

THE TAPE.

On the tape, the slightest movement of the vehicle or the clock produces a distinct pencil record. Each tape is divided into thirty-six hours. The hours are divided into half hours and subdivided into intervals of five minutes. The hour, half hour and five minute divisions are the length of the tape. The width of the tape represents a distance traveled of two miles. The parallel line in the center divides the tape into distances of one mile each, and each mile is subdivided into distances of quarter miles. Horizontal lines on the tape denote that the vehicle remained stationary. Oblique lines denote that the vehicle was in operation. If two miles were accomplished in five minutes without a stop, then the rate of speed would be 24 miles an hour.

A scale is furnished with each instrument, the use of which gives instantly the rate of speed any distance is covered at.

The sample tape illustrated here denotes that the vehicle traversed 25⅝ miles from 10.20 a. m. to 1.19 p. m., and that thereafter the vehicle remained stationary. Between the hours of 10.20 a. m. and 1.19 p. m., the vehicle made eleven stops, to a total of seventy-two minutes. The two miles traversed from 11.32 to 11.37 were made at the rate of twenty-five miles an hour. This speed is ascertained by using the scale furnished with the instrument.

It will be seen, therefore, that the following data can be secured from this tape: (1) The time tape was inserted; (2) The time the vehicle started to work; (3) The total mileage covered for the day; (4) The mileage of each and every trip; (5) The number of stops; (6) The duration of every stop; (7) The total dead time; (8) The speed of any given distance; (9) The average speed; (10) The time the vehicle finished; (11) The time the vehicle remained in the garage.

With this record there can be no lost motion. It absolutely eliminates waste and creates efficiency. Through the use of this instrument, one can be as certain of the movement of the vehicle to which it is attached as though he had driven it himself.

Special provision is made to guarantee that the instrument remains tamper-proof.

A number of large delivery houses in every line are using the Recordograf with a great deal of success. For routing purposes, it has no equal. As a means of protection against accident liability, it is of wonderful service. Several instances of drivers being arrested for overspeeding have been brought to their attention, and upon the production of the tape in court, showing the speed at the time of arrest, the drivers were exonerated.

Its importance to the operator, driver, truck manufacturer and truck agent, as well as to the owner of a pleasure vehicle, is very apparent.

Its importance is in its ability to guarantee you of the service of your truck and its driver for every minute of the day. The delivery stops are known to you to the fraction of a minute. The lunch-hour now becomes a lunch-hour instead of a lunch two hour. Overspeeding which is disastrous, is eliminated.

To the driver it is mainly in the fact that it proves to the employer, that he is strictly on the job and worth his salary. He knows and feels that the man who gives the best service is the man that survives. A driver should have no more objection to the Recordograf than the store clerk has to the cash register. They are used as much for his protection and benefit as they are for your own.

To the truck manufacturer its value is apparent in that over-speeding is eliminated.

To the truck agent it serves as a silent salesman for the product he is endeavoring to market.

To the private owner it is that it absolutely makes detection positive of the unauthorized use of a private car at any time.

The instrument is furnished with one year's supply of tape, complete, attached to the vehicle.

THE TAXIMETER.

American taximeters are well-known to every taxicab rider, and their efficiency and accuracy is unquestionable. A most elaborate control is had over these instruments to guarantee their accuracy, and in addition, every large municipality, through their several departments of weights and measures, make it a practice of thoroughly testing and sealing every taximeter in operation. This, together with the interest of the operator, insures the taxicab riding public of accuracy.

American taximeters are to the taxicab what a cash register is to a merchant. They contain a record that gives to the operator:

(1) Complete information of the cash collected; (2) Number of trips; (3) Number of Extras; (4) The total miles; (5) The total paid miles; (6) The total unpaid miles; (7) The "Not-Recording" time.

Through this record the owner can be absolutely certain of every movement of the vehicle.

A transmission exactly similar to the transmission used on the Recordograf is employed in operating the taximeter.

The taximeter is a silent solicitor of business. It strictly compels honesty in the driver's dealings with the owner. The meter registers every fare collected and automatically totals the result. It records every minute and every mile of the cab's operation, whether employed or not. Dead, or unpaid mileage, the secret of taxicab success, can therefore be kept at a minimum.

Disconnection of the meter is made impossible without detection, by the use of a simple seal.

Through the taximeter, the owner can be as certain of the movements of his cab as though he had driven it himself.

Hupp Yeats Announces New Worm Gear

The new Hupp Yeats Electric Car Company announces to users and dealers that after a long line of experimenting it has succeeded in developing a new worm drive rear axle which is both quiet and efficient.

Hupp Yeats electric cars, with the exception of the rear axle trouble, have proven in actual service to be very satisfactory generally speaking. The annoyance experienced with the rear axle has resulted from the high reduction employed and made necessary by the use of a single set of bevel gears.

The old construction was based upon the theory that higher efficiency could be had through a single than through a double reduction.

That this theory proved to be correct is established by the well known fact that Hupp Yeats electrics, with their direct application of power through a single set of gears, draw a low amperage at a given speed, propelling a given weight.

In making the change from a bevel gear drive to a worm drive, the company has endeavored to eliminate the noise and the difficulty of keeping bevel gears in perfect adjustment, and at the same time maintain the high efficiency, so far as the consumption of current is concerned, of the bevel gear drive.

The aim has also been to develop an axle that so far as motor suspension, spring centers and tread are concerned, would be identical with axles in service, so that exchange of axles could be made quickly and inexpensively.

The difficulties that presented themselves in reaching this end, were many and difficult, on account of the special spring centers, tread and motor suspension of all cars in service. All these difficulties have been successfully overcome.

The rear axle and motor are the most vital and expensive unit of an electric car, for the reason that nearly all the large and expensive bearings in the car are employed in this portion of its construction, and while the worm drive, on account of accuracy required in machining and the high grade of bearings required to take the heavy thrusts, is more expensive to manufacture and install than the bevel gear, yet they will be cheaper in the long run, as all annoyance from noise is absolutely eliminated through this type of drive, and once installed requires no attention beyond occasional lubrication, while their efficiency, in contrast with the bevel gear, increases with use, and their life is practically unlimited.

Application of motor to rear axle housing has been worked out so that it is identical with old construction; that is to say, the motor suspension is the same.

Motor shaft is attached to worm shaft by a short coupling, and motor head is bolted to flange on worm housing by the studs in present use on motor head.

On account of the spring centers, tread and motor suspension of Hupp-Yeats cars in use being special, it becomes necessary to construct the new axle special in the above particulars, so that the axle will be interchangeable with axles in service. In view of this fact it requires about thirty days to bring the new axles through, and in order that replacements may be effected with as little interruption as possible in the service of owners' car, the following method of handling replacements has been suggested:

"Permit us to enter your order for a new axle. When the axle ordered is ready for delivery, we will notify you. You will then have your rear axle detached from car by jacking same up, removing spring bolts, motor, suspension nut and strap.

"When axle has been taken from under car, remove motor by unscrewing the nuts from the motor head studs which hold the motor to the rear axle housing; also remove wheels and bottom springs, crating and returning to us the bare axle only."

The new axle comes painted, with motor coupling ready to be applied to end of mtoor shaft and end of worm shaft, and with holes accurately drilled in worm housing to take the motor studs attached to motor end plate. The axle will be identical with axles in service with the exception that it will have a smaller housing to house the worm gear. The mechanical difficulties to make axles interchangeable have all been worked out so nicely that the new axle will go under the car in place of the old without any special adjustments and can be quickly and easily applied by the most ordinary mechanic or garage man.

Motor Truck Club Entertains

Many members and guests of the Motor Truck Club of America, New York section, on August 18 attended the third annual outing and field day of that body. The event transpired at the Marine and Field Club, Bath Beach, L. I., and was a greater success even than that of last year. Two motor trucks conveyed such of the attendants as appeared at Borough Hall, Brooklyn, between the hours of 1 and 2 p. m., the first to depart being one of the earliest models of Hexter gasoline-electrics, equipped with an inclosed bus body. The other was a two-ton Indiana truck with a platform body fitted with stakes and camp chairs.

The first event was a baseball game between teams which spontaneously rallied around George H. Duck, president of the club, and David C. Fenner, ex-president, as captains. As formerly, the game was umpired by Ellis A. Howland of the *Journal of Commerce,* and secretary of the club. Following the game, which was played for three innings and resulted in defeat of both sides, the hardier members of the aggregation indulged in aquatic feats. After the sunset gun was fired, all hands lined up for a group picture and repaired to the second floor balcony for a real shore dinner. Dancing took place on the main floor of the club house.

Electric Vehicle Salesmanship

Conditions Which Confront a Salesman and Suggestions Which Point to Success

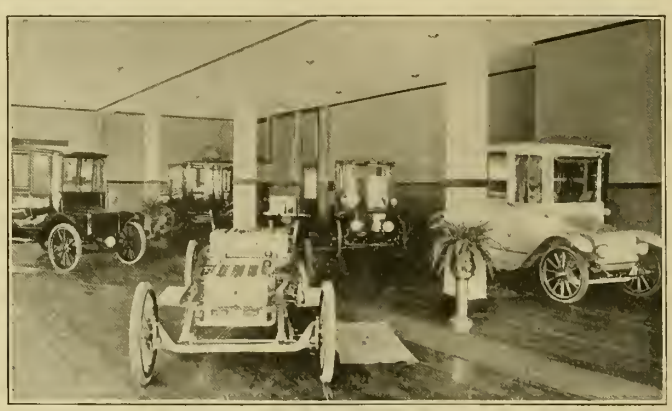
BY R. L. MOFFETT

MANY electric car salesmen, in the way they go after business, resemble President Wilson's recent Mexican policy of watchful waiting. This policy may be all right on the part of President Wilson but in a salesman it is an extremely wasteful one. Sitting in the office with your feet on a desk waiting for someone to come in never paid large dividends for either the salesman or the firm.

Woods' Chicago Sales Offices.

The biggest single factor in a successful salesman is not so much ability as it is action—the proper use of time. Men with big sales records do not wait for prospects, they go for them. There is all the difference between success and failure in the two methods. The hustler wins on the law of averages if nothing else. Furthermore, the hard worker soon becomes a man of real ability through liberal exercise and consequent development of his ability. If time is worth money to any man, that man is the salesman. To waste time is to throw away opportunity to make money.

Many of our men think they know all of the people in their territory who are in the market for electric cars. Possibly they are right, but how about the hundreds of other people who could be interested if an intimate knowledge of the electric and how convenient and serviceable it is were driven home to them? How many people are there who are thinking of getting a gasoline car simply because they don't know how much more service with less trouble and expense, an electric would give them?



Interior View of Woods' Sales Office.

The power to create in them an interest in the electric car lies in the salesman. It can't be done in an hour, nor always in a week. The thing to remember is that the other person's prejudice is due to ignorance on the subject of the efficiency of the car you are selling. Argument in this case is dangerous. What you want to do is to supplant in his mind a favorable for an unfavorable opinion of your car. That is most easily accomplished, not by attacking his present opinion but by filling his mind so full of your conception of your own car and its superior service that his previous ideas are entirely crowded out. In the last analysis, salesmanship is largely a matter of education and this applies with a special force in the selling of electric cars to the class of people as referred to.

Importance of Service.—The giving of service probably affects the electric car business as it does no other line. It has been demonstrated hundreds of times that it is possible to over-do it or neglect it altogether and lose business as a direct result of either mistaken policy.

The service which you ought to give should be divided into two classes, that for which a charge should be made, and that which is free. In making this classification it must be understood that both are a necessity and an important part of the work of the successful automobile business builder.

The Electric Automobile Manufacturers' Association, comprising the eleven leading makers, has gone into the service question exhaustively and has adopted a standard inspection service which specifies just what service should reasonably be given without cost to the owner. A bulletin covering this subject was issued July 1, 1913, and consists of five paragraphs, as follows:

(1) "Free inspection once a month of car at garage or service station, provided it is sent to the station at the time specified by seller. (2) Charge will be made for

this service unless car is delivered at station on day agreed upon. (3) No charge will be made for examining wiring, motor, controller, brakes, steering, running gear, or an examination of the battery to determine its general condition and whether it is being flushed and cared for. Nor will a charge be made for oiling the entire car, which, however does not include repacking of bearings or gears in grease. (4) If inspection developes any needed repairs, due to natural wear, accidents, or other causes, owner will be notified of same and an estimate of cost for doing the work furnished. (5) This service in no way eliminates the responsibility of the garage in which the car is kept."

The object of all service is to aid the owner in getting the maximum efficiency from his car. Therefore it is your plain duty to your customer and yourself to do all you can to see that his car gets the attention it should have. Urge the owner to avail himself of that class of service which you furnish free. If his car needs further attention be equally insistent that he authorize you to do the work and send him a bill based on a reasonable margin of profit to yourself.

Have an early understanding with your customers as to just what constitutes free service and what is fairly chargeable to their account. The big idea to be remembered is the basic one of "a stitch in time" that there is an actual saving in giving the car proper attention at all times regardless of whether the service it requires is free or not. It is your business to see that the car receives proper attention, because it is only in that way that the owner will get the most satisfaction from his machine. It will be difficult for you to carry out this policy unless you thoroughly appreciate the fundamental principles of salesmanship involved. Giving of real service is an important factor in the individual success of any salesman and an absolutely essential factor in permanent success. It is the man who has made friends of his customers, based upon their confidence in his honesty and ability to serve them, who wins out eventually. This is just as true as it applies to the salesman as it is of the firm he works for.

Don't you think the average purchaser would appreciate your troubling yourself about the way his car is serving him after he gets it? Don't let a man run his car to death before calling his attention to the fact that a little oil here or a little grease there might be a good thing for his car. Insist that he bring it in for inspection occasionally. Put a good man on it, examine thoroughly the batteries, springs, controller, wiring, brakes, motor, steering and running gear, etc. Advise him of the cost of any work needed which is not included in free service. Caution him on the proper method of starting and stopping to save current, also the necessity of being careful of his tires by not scraping them against the curb or running in street car tracks. Many of these things are small but collectively they mean increased service to every owner of an electric car. It is to your interest and to the interest of your firm that every owner secure the maximum service. In addition to this, the fact that you show your interest in the car is bound to make a tremendous impression on the mind of the owner and will result in his recommending the car and the salesman who sold it.

Not every car owner is unreasonable. Most of them at the time they buy their car expect to have more or less trouble later on. If by a little interest and attention on your part you can lessen his troubles to a point below his expectations, you will have accomplished something which will be a big asset to you in the securing of future business.

THE ADVERTISING POLICY.

All salesmanship as well as advertising is educational. The advertising man, however, has a message somewhat different from that of the salesman because his audience is quite different in most cases. The salesman talks to prospects—presumably prospective buyers of some kind of an electric pleasure car. These prospects have usually been educated up to some degree of appreciation of the advantages of the electric type of vehicle and are considering which one will give them the best satisfaction. Assuming that the prospect has finally made up his mind to buy some electric car, then the features and characteristics of your particular car are of the greatest interest to that prospect, and are the natural points to be taken up and discussed. At best there are only a few such prospects, from one to several dozen, in any local territory.

The printed advertisement, on the other hand, particularly if it be inserted in the newspapers, circulates among thousands who have the money and who could use an electric but who have never been impressed strongly with the great convenience or efficiency of an electric. Not knowing much about this type of car—possibly not having thought much about it—they remain satisfied with their gasoline machines or without a car of any kind. To such people advertisements announcing the "handsomest," "biggest," and "best electric in the world" are not particularly interesting; not being interested in the electric car, they naturally are not interested in which one is the best.

People who ought to be prospects for electrics but who are not, through ignorance of what the electric will do, outnumber the actual prospects a hundred to one. It is to this class very largely that advertising salesmanship is directed. The object is to turn disinterested people into interested prospects—to create more material for the salesman to work upon.

Priceless Value of Enthusiasm:—Some men smile so sincerely we can't help catching their smiles if we tried. The most powerful calcium light will not cheer us half so much as the stealthy ray of sunshine that seeps through a rift in the clouds.

Enthusiasm may be sown like seeds, and the human mind is the real and only logical fertile ground in which the seeds of enthusiasm will grow. The salesman who is so genuinely enthusiastic that he keeps saying, "I cannot fail," is sure to be more successful than the salesman who says, "I will make them feel I am a winner." One has the calm, assuring confidence of knowing and the other is a bluff. Even the most persistent opposition will melt before real enthusiasm. This is because the buyer feels that the salesman must be right or he could not be so enthusiastic. The salesman who continuously looks as though he had arisen from a sick bed to do his duty, does not bring or leave the spark of confidence that is so essential in salesmanship. There is a foreboding to his very presence that gets the transaction down to a dull drab basis. But the salesman who calls on a

prospect with confidence and satisfaction beaming out of his eyes and commanding his very presence is a magnet that attracts consideration.

A dynamo that is silent may look like the dynamo in operation—except that the one that is running and generating power throws off the spark. It is alive. The salesman is either the silent dynamo or the operating, power-generating dynamo. He either causes no interest or he sparks his way into the good graces of his customer. We all feel the moods of others. All our use of senses, our generations of observation and our natural intuition unite in making us feel the spirit that moves those with whom we come in contact. Enthusiasm is contagious. In order to arouse the customer's enthusiasm about your car to a point where he will give you an order, you must be full of and show enthusiasm to its fullest capacity.

Finding the Point of Least Resistance:—To every sales situation, and in every person, there is a point of least resistance. The argument that convinces one, is lost on another. Sometimes the "reasons" given for buying a certain car are so at variance with our own ideas they seem illogical. A big factor in salesmanship is the art of probing for the point of least resistance. In some men, pride is the big thing. In others, fairness is the predominant factor. In still others, fear that someone else will get ahead of them, is the ruling passion. Regardless of the outward appearances of people, it is well to remember that no one is armorclad. The greatest men have at times been led into pitfalls by trivialities. You need not fear that your weakest talking points are valueless arguments. Lack of experience in the buyer gives rise to many unworthy arguments on his or her part. Perhaps it is impossible to educate your prospect then and there. He must be fought with his own weapons.

The power of argument, then, is one of the greatest fortifications of salesmanship. Some of the hardest sales have been closed through the use of statements which were far from being as strong as those which had previously proved futile. But they struck home to the buyer, because they likely recalled something important in his life and gave him a viewpoint that was favorable to the purchase. A broad knowledge of things strictly human is a wealth that every salesman can cash in. Reading human nature is really being able to ferret out those points of least resistance common to all men but differing in men just as experience differs. It will pay you to take time to study the men or women you are trying to sell. Watch for some chance remark which will give to you the very ammunition you need in deciding your effective point of appeal. Remember that the salesman who will not admit defeat will seldom be defeated. Setbacks are not defeats. Success never moves forward unbrokenly but is a succession of ups and downs with the ups predominating.

Time Limit in Making Good:—In the game of making good, there is a time limit. When we were seventeen the future to us was a world unexplored, with time unlimited. But at 37 or 47 our perspective has changed. We look into the future through wiser eyes and are startled. Time has acquired boundary lines. We look back at opportunities lost—at things done which we ought not to have done, at things left undone which we ought to have done, long hours and well meant labor which proved fruitless. And it shows in our score. We stand at the crest of the hill, the game is half over, to win we must capitalize the future with experience gathered from the past. But we cannot afford to put off until to-morrow. We cannot afford to miss even one opportunity. There is a limit, a time limit, and every day, every hour, every minute is reducing just that much our chance of rolling up a good score in the game of making good. We find the man who is making a record, the man who is piling up the best score, is the man who labors less and thinks more; the man who systematizes and who studies himself as well as his prospects. Each day the salesman has certain valuable experiences. He either did something exceptionally clever or extremely bungling, and each night when these experiences are still fresh in his mind he should turn them over and analyze them. The time to learn a thing is when the necessity of learning it is present. By reviewing each day the work of that day, the salesman gradually builds up an automatic skill that does not depend upon the reason of the moment—but is the reaction of special knowledge gained by previous experience. Response arising to each occasion, and meeting that occasion's demands is simply the result of long training.

Strain of "Nerve" and the Poise of Confidence:—Brass glitters much more than steel, but steel is the stronger metal. However, in the compensating pendulum, there is both brass and steel, because heat that expands steel, contracts brass; and cold that contracts steel expands brass. A little brass with plenty of steel is a good combination for salesmanship. All steel and no brass might wear out. All brass and no steel might get thrown out.

Confidence is mostly knowledge, but partly training and a little brass. The brass expands under the chill of a cold reception, and the steel is present to stand the sterner strains. Ungoverned "nerve" is not salesmanship. It might carry the salesman into an audience, but that is just the beginning. The more the buyer knows the less he proposes to be bullied, and salesman's "nerve" soon or late resorts to bluff. The best bluff is the kind fortified by knowledge. The salesman who knows he can make good the bluff is never fearful of being "called." Confidence radiates but mere "nerve" irritates. Confidence will win, but "nerve" will rasp. The nervy man is ever finding new fields. The confident salesman is gaining strength in the same field. The bed rock of confidence is the belief in one's line. The salesman who attempts to sell that which he does not believe to be worthy—who doesn't first sell himself on his own car, becomes a confidence man in his own vision. He refers to his prospects as "suckers." Every sale he makes appears to him like a safe blown. But if he believes in what he sells, then there is no reason why he should lack confidence unless it is a reason of health. That is a matter wholly within his own domain of repair, if it is due to careless living. The salesmen who will succeed in the future are those who to-day realize that it is their duty not to deceive people, but to serve them, and the deeper their knowledge goes the more confidence their patrons and prospects have in them. It is this confidence that they cash in on, and that, like a good investment, must grow. Confidence breeds all that is positive, but "nerve" brings out what is negative. The one attracts, the other repels, and that difference is failure or success.

Co-Operate to Succeed:—This is called an age of specialization, but it is even more an era of organiza-

tion. An organization necessitates co-operation in the fullest sense, between the various units of the organization. Any organization is bound to be weak whose various parts do not work together easily and freely. Failure to co-operate produces friction and every automobile man should know that unnecessary friction in an organization, as in a machine, is a formidable foe to efficiency and permanency. The man who cannot or will not co-operate is like back pressure in the cylinder of an engine. He wastes all his strength in negative effort and in doing so he actually offsets the positive effect of the work of others. He acts as a clog, a brake, which effectually interferes with the proper and economical operation of the business machine.

The successful are men who have breadth of vision to see that, no matter how important any one man's work may be, he is still only a part; that he must depend upon other parts, as other parts depend upon him for the greatest measure of results from the organization as a whole. If each man clearly realizes this, if he will keep at all times in mind the ultimate object of the work in hand, and which requires the united effort of all, he will, on occasion, subordinate his own immediate interests to those of the organization. This is an ideal, but it is a practical one, which every man of us can reach. Those who fail to do so are placing an unnecessary limitation on their value to the organization, and are seriously handicapping themselves in the race for success. We have a good illustration of the effect of proper co-operation in the human body. Personal efficiency is dependent very largely on the harmonious working together of mind and muscles in the body. For example, the star league ball player, the champion golf or tennis expert, the professional juggler or magician whose quickness deceives the eye, are not necessarily brainy men, nor do they always have exceptional muscular strength. The secret of their great cleverness lies in highly developed responsiveness of muscle to mind, and mind to muscle. There is a lightning-like connection between brain and mind and foot which astounds the observer. Psychologists call it "co-ordination," which is practically the same as co-operation between the various units of physical and mental organization of the man. The efficiency of such men is not due to their mental or physical strength, but because they have developed the units of their bodies, brain cells, nerves and muscles to a high degree of co-operation, one with the other. To a great extent the personal efficiency of the salesman depends upon a similar development of his five senses. In the business organization the analogy is complete. An organization can get along without men possessing great personal ability much better than it can do without the co-operative spirit, the responsive habit of helpfulness between different individuals and departments.

Every sales manager knows of sales that have been made by methods, or under conditions, or upon terms that, no matter what their profit at the time, represent a real liability to the company for years afterwards. Such sales ought never to be made, because they will make the work more difficult for other salesmen at other times. On the other hand, there are times when the reasonable demands of a customer have been met at an actual loss, but which every experienced sales builder knows to be good business. Some such assets are so real they might as well be included in inventory of things having a cash value.

Failure to recognize such situations as these in their true light frequently results in making one department of the business suffer in order that another may make a showing. This works against the interest of the business—makes it harder to get and to hold business in the future. We must learn to look at every task in its broadest significance as the means to an end, a part of many things which go to make up the means to the ultimate objective of business building. If you are to be an individual success in your present position you must help the success of your organization by co-operating fairly and freely with every other unit in the organization. The first step in this direction is to realize thoroughly how important co-operation is to you and to us all.

Asking the Price in the Face of Competition:—The loudest complaints of the fierceness of competition and of the days' experience in making sales usually come from the man who sells the fewest cars with the least advantage to himself and to the company. Usually he is in that position simply because he does not know how to do better; does not know how to present his case properly and has not acquired skill in the art of asking the price. The mere statement of quoting prices to the buyer is not the art, nor even the semblance to the art of selling goods. The so-called evils of competition arise largely through the participation of incompetent men in business affairs. And the very men who create the evils are the greatest sufferers from them: Good business men are good competition, and no matter how much business they do, they are well regarded by every other salesman. It is a real pleasure to compete with other enterprising business men. When they take the order away in a fair contest one rather enjoys the game and applauds their skill.

Many men would be more successful if they would be more impartial in their views, or perhaps we might say, if they would be more courageous from the business standpoint. There is a condition of mind which causes the one who has it to stand still and stare open-mouthed and awe-stricken at the success of others who are boldly and energetically making sales; this condition we may call "fear of competition," and fear of competition, not unlike fear of disease, will often produce the very condition anticipated.

The salesman must prepare to meet a constant down-pour of the rain of competition. To secure the best results, he must assume an attitude toward his competitors which causes him to virtually forget them. It is, of course, impossible to utterly ignore competition, but as the sprinter in the one hundred yard dash, so in salesmanship, the one who looks not behind, but steadily keeps his eye on the finish is more certain to win, or at least make his exertions count for their full value.

The salesman who does not have the answer on the tip of his tongue, a ready answer to every inquiry or objection, does not know his business. The following are a few points on the art of asking the price—and getting it:

(1) Good common business sense; (2) Knowing all about your car so that you may present all points at their full value; (3) Being able to answer all questions; (4) Asking the price you ought to get—and knowing why you ought to get it; (5) Knowing that salesmanship is the application of knowledge of goods and that you must talk in such a manner that the buyer agrees with you and buys your goods; (6) Knowing that telling the truth is an art requiring more

skill but yielding vaster and greater returns than the art of telling a falsehood; (7) Knowing that the good salesman is never compelled to lie about his car, and yet, when telling the truth about it he must tell it well; (8) When you believe a thing yourself it is a great deal easier to make some one else believe it; (9) Knowing that every point learned is so much gained, but that you will never know all there is to be known; (10) "Realizing that the law of salesmanship, like the law of worthy life, is fundamentally the law of strife; it is only through labor and concentrated effort, by grim energy and resolute courage, that we move on to better things" and greater sales.

Overloading Costly

Manufacturers have come to realize that, while every reasonable effort should be put forth to make every truck give satisfactory service, it does not pay to take care of customers too much. Persons who are taken care of soon become unreasonable dependents.

In this business, they are a burden on the manufacturer and the dealer. Coddling makes them feel that they do not need to use their trucks carefully, because the cost of repairs does not fall directly on them. They do not warn their drivers or their shipping clerks against overloading or fast driving because they are likely to think "If anything breaks it will not cost me anything to get it fixed."

The words *service* and *guarantee* have been misunderstood. Manufacturers are agreed that the warranty covers the maker's responsibility for the quality of material and workmanship in the vehicle, but does not cover wrong usage after it passes beyond his control and supervision. The correct idea of service is to provide a place and stock of parts convenient to the truck owner where replacements and repairs can be made quickly and properly at a reasonable cost; to inspect the equipment of the owner from time to time and to offer advice and instruction to drivers.

It is important that the branch manager, the dealer, and the salesman should do all they can to show the truck buyer the fallacy of trying to get something for nothing out of the truck; that it is cheaper in the end to make two trips than to carry a 50 per cent overload and that it is more economical to buy a larger truck or an additional machine than habitually to carry almost a double burden.

A single case of overloading may crush the tires, spring an axle or steering knuckle, give a set to the springs, twist the drive shaft, stretch the chains or cause other injuries that may not be revealed until some time afterward. Every case of this kind and every dissatisfied user is a detriment to the business and the harm done is not confined to the particular truck or make of truck that is abused.

Manufacturers, dealers and salesmen have all had a share in encouraging the truck buyer to expect too much of his purchase—by rating the carrying capacity too high, by advertising overload capacity, by making demonstrations with excess loads at high speeds and by taking orders for trucks that were not suited to the work to be done. The new policy is not to exaggerate the capacity and speed of the vehicles. Substantial success can come only through re-orders. No one can live long on sales to new customers only, and re-orders do not come from disappointed users.

Anxiety to make a sale must not lead to extravagant claims that are not authorized by the manufacturer. Salesmen should stick to the load and speed ratings given in the catalogues and to the terms of the maker's warranty. When making demonstrations, dealers should take particular pains to see that no overloading occurs and then instruct the driver to keep within the rated speed of the machine. If the dealer permits overloading and overspeeding, he encourages the driver to do it habitually, with the inevitable result that the truck keeps coming back for repairs and replacements, until it becomes a veritable nightmare in the garage or service station.

England Offers Big Opportunity

English central station engineers have now the opportunity of their lifetime to further the interests of the electric vehicle. In spite of statements to the contrary, it is certain that in the immediate future gasoline, if obtainable at all, will be sold at prohibitive prices to private and industrial users. The government, having commandeered omnibuses and other motor vehicles of all kinds for transport service, must be assured of ample fuel, and this cannot fail to restrict supplies to the public. Then, again, the war office has taken over motor vehicles and horses used for municipal purposes, and local authorities may find a difficulty in collecting house refuse, carting materials, and so forth. In these circumstances the electric vehicle has an unique opportunity of proving its merits. There can be no question of restricted facilities for battery charging, and it is unlikely that the price of energy will rise. With the possibilities of a gasoline famine, users of commercial motor vehicles, as well as municipalities deprived of horses and wagons, ought the more readily to lend a willing ear to the claims of electric traction. That these efforts will be backed up by the makers goes without saying, and we are glad to note that English and American firms are in a position to promise early deliveries. Agents for German makers will perforce have to suspend operations during the continuance of hostilities, and possibly for a long period subsequently, while it will unfortunately be difficult to obtain delivery from France. A similar difficulty exists with any make of Continental car, but no trouble should be experienced in shipping vehicles from the States. The Edison Company obtains the chassis for pleasure and light commercial cars from Scotland, and heavier chassis from the States, neither source of supply being affected.

It lies with central stations to make the most of the present opportunity, and we sincerely trust that they will rise to the occasion, and while gasoline transport is temporarily at a disadvantage, ensure the establishment of the electric vehicle industry upon a substantial basis in England.

Exhibit Vehicle During Convention

One of the interesting features of the fifth annual convention of the Electric Vehicle Association, to be held in Philadelphia, Monday, Tuesday and Wednesday, October 19, 20 and 21, will be a very complete exhibit of electric vehicles, batteries and accessories, which exhibit will form a special section of the Philadelphia Electric Show, to be held October 19-24.

It is expected that the electric vehicle exhibit will be comprehensive, interesting and instructive, many new developments being shown for the first time on this occasion.

Motor Truck Club Establishes Legal Aid Bureau

A Department to Keep Truck Users Informed as to Laws, Ordinances and Regulations

IN the report presented at the last annual meeting of the Motor Truck Club of America, says the *Motor Truck Club Bulletin*, the retiring Board of Managers and Committee on Ways and Means, suggested the establishment of a Legal Aid Bureau, as one of the important activities which should be taken up by the club.

The board of directors, with the assistance of Ernest K. Coulter, counsel to the club, have worked out a plan on which this bureau is to be conducted and which will include:

1. The preparation for distribution to members of the club of a brief and exact statement of the laws, ordinances, and regulations relating to subjects of interest to motor truck owners and users.

2. The establishment of a school of instruction for drivers and others, as to laws, ordinances and regulations, relating to motor truck traffic.

3. Appearance in court for drivers and others arrested and summoned for violation of the laws, ordinances and regulations.

4. The appearance in court in cases where there is loss of property or personal injuries will result in the obtaining and prepetuating of evidence to be used in the event of civil action.

5. The bureau will also advise whether or not to plead "guilty" in cases where the magistrate has not the trial jurisdiction, and which, if held, would have to go to special sessions.

6. The bureau will also examine all proposed laws, ordinances and regulations affecting motor trucks and will make recommendations as to the advisability of supporting or opposing same.

7. The bureau will also prepare proposed laws, ordinances and regulations, as the club may deem necessary or advisable and render whatever legal assistance may be necessary in obtaining the passage thereof.

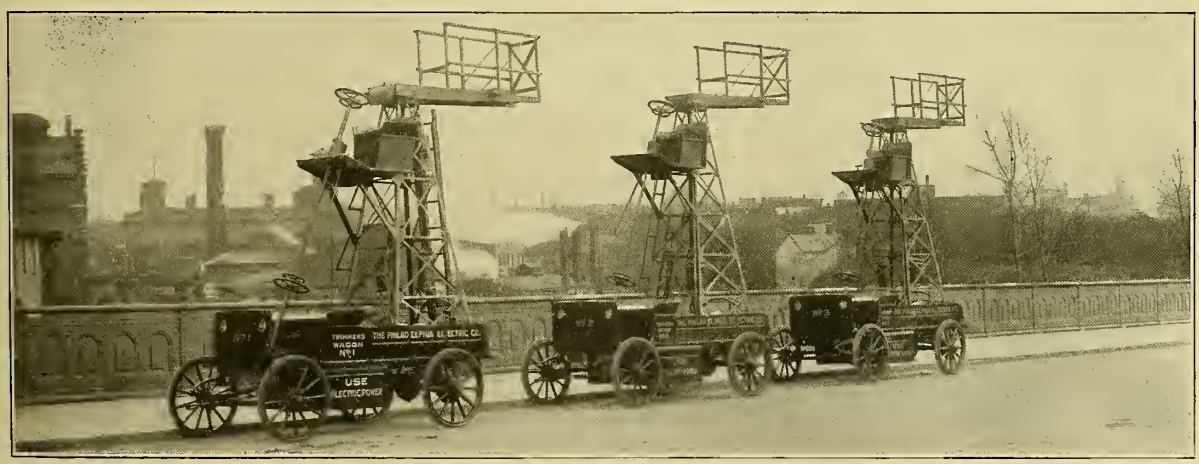
8. The bureau will prepare statistical data showing violations and the disposition of such cases.

9. The bureau will conduct appeals from the magistrates' courts in those cases where it is advisable.

10. It is probable also that some arrangement will be made so that the services of the Legal Bureau will be available to members of the club for the defending of civil actions, arising out of injuries to property or persons.

In addressing the New York division of the club, at their meeting held on Wednesday evening, June 17, Mr. Coulter said:

"The plan to establish a school of instruction is the result of a suggestion from one of the magistrates. Many of the cases brought into court are the result of a lack of knowledge on the part of the defendant of the laws, ordinances and regulations, and it is expected that by conducting such a school the number of cases of violation can be reduced, thus effecting a saving of time and money. This school could be conducted at night and the work will be in the form of lectures and written and printed instructions. In many instances the appearance in court for drivers and others arrested or summoned for violation of the laws may be done without the attendance of the defendant in court, and the result will be a saving of time for the driver and his truck. The law provides that in the case of an alleged misdemeanor the defendant can be represented by counsel and tried in the defendant's absence. (*Code of Criminal Procedure, Section No. 356.*) While some of the magistrates do permit pleas of "guilty" to be made in absence of the defendant, in such cases this apparently is done without authority of law. Appearance in court, in cases where there is loss of property or personal injuries, is a most important phase of this work, as very often a defense is developed in this preliminary trial which would be lost otherwise, and often matters get into the record which prove damaging in subsequent civil action, which, had the case been properly handled in the magistrate's court, could have been explained away. Now, again. Apparently,



Commercial Truck Company's Special Central Station Electrics.

through inadvertance, jurisdiction has not been given to the magistrate's court over a few violations. The result is, that in cases where the plea of "not guilty" is entered in the magistrate's court, the magistrate is forced to hold the defendant for special sessions, and in these cases, at least two different appearances are necessary—one to plead and the other for trial—and as a matter of fact, it ordinarily requires a number of appearances, owing to the congested conditions of the court calendar. In cases where the defendant is held for special sessions, it is nearly always necessary that bond be furnished, with accompanying delays, inconveniences and expense. A plea of "guilty" in the magistrate's court would, in such cases, save time and expense. The moral effect upon drivers and other employes who are called upon to go to court, without being represented by counsel, and who do not understand the legal procedure or the ways of the law, has been bad and we cannot but feel that this has often worked to their inefficiency and to the loss of the owner—the driver frequently saying: 'This is just another case where I get the worst of it.' That spirit in employes sometimes leads to disaster in business. From our talks with magistrates and others connected with the courts, we are convinced that even more rigid traffic regulations may be expected soon and thorough enforcement of existing regulations, thus due to the increasing congestion. Under these circumstances, we believe that it is most important that this Legal Aid Bureau should be in a position to meet conditions as they arise. This department will undoubtedly become one of the most valuable and important works of this organization."

Electrics for Central Stations

The Philadelphia Electric Light Company has adopted a special electric, with a steering wheel mounted on an inclined column with a control wheel immediately below, as shown in the illustration appearing on page 95 of this issue. In order that the car may be equally well controlled by a man on the upper platform, the extension of the steering rod is carried upward and backward to the top position, a duplicate steering and control wheel being mounted in that position. The controller is of the continuous torque type mounted on the chassis and forming the base of the steering column. Its position places it in the most desirable place for inspection, leaving the space under the seat available for loading and other purposes. The controller gives three speeds forward and two reverse, without breaking circuit between points, making the acceleration smooth and without sudden jerks or strains on the gearing and tires. The steering gear is mounted on the frame immediately below the controller, the steering shaft passing through the latter.

The drive or reduction gear from the motor to the rear wheels is the Hindley type worm and gear. By the use of this type of gear, it is possible to transmit the power from the motor to the rear wheels by a single reduction, thus avoiding complication and the large number of parts necessary where double reduction is employed. The rear wheels are mounted on taper roller bearings entirely independent of the driving mechanism, and are driven by floating shafts engaging the outer end of the wheel hub, the inner ends of which slip by means of squared ends into the hubs of bevel differential gears. The whole mechanism is immersed in oil, giving a minimum of wear and noiseless operation.

The rear construction, consisting of the motor, gear casing, axle housing and gear wheels, with the gearing and driving shafts, constitutes a complete power equipment which is readily removable for inspection and repairs. All parts of the driving unit are set in a fixed and unalterable relation to each other. Ample braking capacity is provided in the internal expanding brakes. The brake is controlled by a foot-lever, and is reinforced by an electric emergency brake, and either of these is ample to hold the vehicle under any condition. The battery used is of an improved lead type or Edison type giving 85 volts, the capacity being adjusted to suit the service requirements. In the 500-pound wagon it is of 16 amperes' capacity, while in the 1,000-pound wagon it is rated at 22 amperes. The rated speed is 15 miles per hour, and the mileage is 40 to 60, depending on the battery equipment.

N. A. C. C. a Valuable Factor

Plans are being perfected by the National Automobile Chamber of Commerce for a convention of commercial vehicle interests, to be held in Chicago some time in October, to further advance the excellent work that has been done during the last two years.

Those who have followed the work of the commercial vehicle department are aware of the important things that have been done since its establishment by the organization of manufacturers.

It has advertised extensively the advantages of motor vehicles for business purposes and sought by proper means to oppose unfair legislation affecting trucks. In addition it has, among other things, accomplished the following:

Worked out standard speed ratings, body weight allowances, warranties, caution plate, frame widths and lengths and schedule of demonstration charges which have been recommended by the National Automobile Chamber of Commerce and are coming into general use in the trade.

Held the first and only conventions of commercial vehicle makers in America to promote co-operation and interchange of ideas.

Collected, analyzed and published statistics of production of commercial vehicles.

Issued numerous reports showing the economy of the motor truck in ton-mile cost of hauling, relief of traffic congestion, saving in street cleaning cost and other advantages to individuals and communities from use of motor vehicles.

Made an exhaustive study of solid tire mileage and conditions affecting it, issued various reports on the subject and influenced several tire companies to experiment and bring out new forms of tires to give greater mileage.

Gathered information on causes of solid tire wear and destruction for distribution among truck users, with the object of reducing the cost of tire upkeep and increasing motor truck economy.

Advocated the building of smooth, hard, durable roads and streets suitable for the operation of motor trucks and at the same time more economical of maintenance than present pavements.

Supplied data showing the evils of overloading and overspeeding.

ELECTRIC VEHICLES

Published Monthly by

ELECTRICITY MAGAZINE CORPORATION

Monadnock Building, Chicago

Telephones: Harrison 3014—Automatic 61028

New York Office, 1022 Longacre Building, 42nd Street and Broadway.

Ed. J. Mock and Paul H. Woodruff, Editors

Fred B. Schafer, Associate Editor.

Allen L. Haase, Advertising Manager

Entered as second-class matter January 22, 1912, at the postoffice at Chicago, Illinois, under act of March 3, 1879.

TERMS OF SUBSCRIPTION

United States, Cuba and Mexico	Per year,	$1.50
Canada	Per year,	1.75
Foreign countries within the Postal Union	Per year,	2.00
Single copy		.15

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office of publication not less than ten days in advance of date of issue. Regular date of issue, the first day of each month. New advertisements will be accepted up to within five days of date of issue, but proof of such advertisements can not be shown in advance of publication.

NOTICE TO SUBSCRIBERS

Remittances—Remittances should be made by check, New York draft or money order, in favor of Electric Vehicles. Foreign subscriptions may be remitted direct by International Postal Money Order.

Change of Address—The old address should be given as well as the new, and notice should be received two weeks in advance of the desired change.

This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in Electric Vehicles *or any voice in its management or policy.*

CHICAGO, SEPTEMBER, 1914

TABLE OF CONTENTS

COMING INTO ITS OWN.

IT will be remembered that during the last annual convention of the Electric Vehicle Association held at Chicago those visiting the convention hall were furnished with a souvenir copy of Electric Vehicles.

During those few days every registrant had an opportunity to read and to study the valuable articles and information published in this strictly electric vehicle magazine.

Many became subscribers. Others recommended that their firms purchase subscriptions in wholesale quantities, to be distributed to their various departments.

A number of enthusiasts even ventured so far as to suggest its value as the official organ of the national organization. Steps were taken to secure this result, but the national organization, controlled by central station men and represented by a central station paper, was unwilling to make a change which would withdraw a central station factor of influence and introduce an electric vehicle manufacturers' representative.

At any rate the association was at that time a comparatively small body; each and every member enthusiastic for its success, yet entirely lacking in co-operative system.

Since this last convention, however, many changes have come to pass with the assistance of an able executive secretary and an efficient staff of assistants. Many new sections have been formed and the association has developed into a splendid society. This increased development in efficient promoting has encouraged electric vehicle manufacturers to put forward their best efforts both physically and financially in making the society return a hundred per cent value to the industry. Vehicle manufacturers have shown a great interest in the work. As a direct conclusion they have succeeded the central station men as the controlling interest. Central stations have started the ball rolling. Manufacturers have stepped in to keep up this success which the association has already been instrumental in securing, and today we have a strictly electric vehicle association promoted to increase electric vehicle sales and governed to a great extent by electric vehicle interests. With these changes —these new conditions—Electric Vehicles is destined to find still greater favor with the new powers to whom it directly appeals. Through its editorial value it will automatically secure its legitimate support by virtue of the character of articles which it publishes and of the constant interest and respect of the association, and especially the electric vehicle interests directly or indirectly affiliated.

In spite of the obstacles presented to a new product in a new field—the engineering of schemes to deprive it of its legitimate prestige—Electric Vehicles has grown constantly better because of its thousands of bona fide readers, a clientele which has ever encouraged its progress. And its monthly advent is becoming a necessity to those who are interested in keeping themselves posted on electric vehicle conditions throughout the country.

The national organization, under the management of an efficient executive secretary, is extending its sections and resulting influence throughout the country. Just so is Electric Vehicles gaining a stronghold in each of these new fields. Where a year ago this publication was purely a "newcomer," 1914 convention registrants will greet it as an old friend and congratulate it on its success.

Many have predicted that the success of this publication would depend upon the success of the industry.

The national organization proves beyond a doubt that the business has become a substantial and permanently established part of modern industry.

It is only fair then that Electric Vehicles should expect of these interests which it represents its share of the support which alone can make it wholly representative of the power and prosperity of the electric vehicle business.

INCONGRUITY.

IF we were asked for a specific definition of the word "incongruity" we should be tempted to point to the spectacle of a company selling electric current and using gas-driven vehicles in its business. If the gas car were the only efficient means of transportation, if the electric company were not in so many cases in direct competition with the local gas company, the incongruity would not exist.

Now, perhaps most people do not know or care about the difference between a gas car and an electric car—though we are trying our best to educate them to that difference. And of course a "gas" car is not operated with illuminating gas. But the layman's broad and somewhat humorous view of technical things nevertheless makes a gas car, in his eyes, appropriate for a gas company and an electric car proper for an electric company.

Enterprising electric central station companies are now offering a multitude of current-consuming electrical devices, most of them substitutes for old manually operated apparatus. But the central station needs very few of these devices in its own work. If it operated a laundry it would probably not use gas-irons or ordinary cast-irons; nor would it belt its washing machines to a steam engine. We should not expect the central station's restaurant for employes to cook with coal stoves or gas ranges—though perhaps they do just that in some cases.

The gas company in Chicago has been consistent enough to light its mammoth modern office building, one of the finest in the country, with *gas lights*—except in those offices where tenants insisted on electric illumination. Yet so accustomed are the people to electric lighting that it is doubtful if much comment would have been occasioned had the gas company used it.

We could hardly expect the gas company to use electric battery driven vehicles in its business so long as any other type would do the work. Sentiment, if nothing else, would be against it. Neither should we expect an electric company to use gas-driven vehicles in their business; but they do it.

It has been well said, we believe by a central station man at that) that every motor vehicle is an isolated plant. There is just as much incentive for the central station to supplant a gas vehicle by an electric as there is for it to place electric motors in a steam engine driven machine shop. And there is just as much sense in the central station using gas cars for its own work as there would be in its using gas or steam engines to drive its repair tools and its exhaust fans.

We have sometimes thought—and said—that perhaps the electric vehicle manufacturer expected too much of the central station. The latter did not ask the former to supply a new current-consuming device, and is not bound to boost it unless it is enterprising enough to want to. But be that as it may—for the argument is by no means settled—we can all agree to the ludicrousness of a central station man driving up in his own little gas engine plant and trying to induce a "prospect" to discard gas engines in favor of electric motors! Incongruity, thy name is Central Station.

THE AMERICAN-MADE CAR'S OPPORTUNITY.

THE European war situation has thus far had little effect on the electric vehicle situation, at least from the standpoint of importations. The few parts imported to this country can easily be manufactured here and consequently this industry will not suffer to a great extent from this cause. The war situation in England has been exceedingly encouraging to our exportation of electric vehicles. A prominent English trade journal states that the almost complete disappearance of all commercial vehicles, the slump in horse flesh and the high price of gas, have placed those dependent upon speedy transportation at a great disadvantage. The entire supply of electric vehicles has been practically exhausted. Every nerve is being strained in England to get machines from the United States, and one if not two firms who were agents for German made machines are already taking steps for the manufacture of vehicles in England. Meanwhile those central stations which have done any campaigning and demonstrating in conjunction with manufacturers are being bombarded with inquiries from prospective customers who will buy at almost any price; all of which is most encouraging, and especially to those American manufacturers who are supplying the English trade. English engineers are introducing the best charging facilities possible, practically all of the electric vehicles are working overloaded on heavy mileage and consequently calling for rapid supply of current for comparatively short periods. Special instructions are being given to various shifts in order that they may properly handle the vehicles brought in to be charged. If the lack of motor transportation exists for a sufficient time there isn't the slightest doubt but that this forced trial opportunity of the electric will soon demonstrate its value in economy and reliability.

MOTOR TRUCKS ADVERTISING MEDIUM

IN a system of perfect bookkeeping a large portion of the cost of maintaining a motor truck delivery system would be charged to advertising. By this method justice would be rendered to the amount of profitable publicity that accrues from possession of a new power vehicle. The motor truck, with the name of its owner prominently displayed, is a moving billboard that advertises a firm in all parts of the territory in which its business is located. A power vehicle is accepted by the public as a demonstration of the ability of a firm to make good its delivery promises, and to reach on schedule time sections inaccessible to other forms of transportation. This kind of advertising is invaluable. It is both a business-getter and a business-holder. Such advertising costs nothing in direct outlay. It is a bonus with the truck. It comes as an incident of an improved service.

Many business men believed that such advertising was destined to have a short-lived effect. It was expected to bring results only during the time that trucks were a novelty. The truck is no longer looked at from the standpoint of curiosity, but in place of the interest aroused by novelty has now developed a permanent appeal that is destined to exercise its unceasing influence in the interest of business for the owner. The man who has a truck gets business because customers look for the coming of the vehicle. They know that a truck means reliable delivery. Naturally business goes to the firm that promises this.

The Central Station's Greatest Opportunity

A Paper Read Before the Southeastern Section, N. E. L. A. at its Second Annual Convention

BY A. L. DIXON AND F. N. CARLE*

LESS than five years ago it was still easy to find central station men who were not at all enthusiastic over the assertion that the electric vehicle had come to stay. Today, whatever may be the attitude of the men responsible for the manufacture and distribution of current toward the efficiency of the electric passenger car or truck, there are few indeed, who question the above statement. So we may consider that point agreed upon.

Mrs. E. E. Jackson in Her Ohio.

Three things have retarded the adoption —or at least the exploitation — of the electric vehicle by the smaller central station:

1. The relatively slow perfection of the electric by the manufacturer.

2. The unsatisfactory experience of some central stations with current consuming devices or appliances.

3. The wrong presentation of the electric to the central station manager by the electric vehicle manufacturer.

The development of the electric has hinged on many things. Electricity is a primal force, always with us in one form or another, yet little understood by the layman. There are times when he appreciates its tremendous power, but in his mind it is part of the general scheme of things now taken for granted in home, office or factory. The electric vehicle is also the opposite of spectacular, and its relatively quiet performance is not impressive when contrasted with that of its noisy co-worker.

The electric vehicle has always been more or less peculiar to itself. Economic law has been the greatest factor in its development and still controls its field of activity. Fifteen years ago it was relatively further advanced than was the gasoline vehicle, but the latter being in its early days strictly a sporting proposition, to quote Dr. Steinmetz, had a very rapid development—a development which retarded in many ways the growth of the electric. Between 1897 and 1907 the electric, and particularly the commercial electric, was like a tree showing but slow upward growth, while the roots were striking out deeply under ground. Central station men are only normally impatient but many of them could not see why the electric should not keep pace in development with the gasoline car. They forgot that the vehicle itself could be no greater than the storage battery which contained the source of power and that the battery was being developed largely independent of the vehicle. Some of your engineers still have their own pet ideas about batteries, not only as regards their basic construction but of their care and operation as well.

Comparing Motor and Horse Efficiency.

As a result, the electric progressed only about as fast as certain outside limitations were removed, and some of these limitations (often a blessing in disguise) are still with us. The vehicle itself may approach perfection in design, construction and operating efficiency but it cannot compete with the gasoline touring car or with the horse vehicle while waiting for hours at a pier. It won't take the place of the mule on some types of roads. And with ideal operating conditions, it may not be an economic success with current costing the user 12 cents a kwh. All these factors influence distribution, which in turn dominates production, while production controls price, or the other way around the vicious circle, as you see fit.

Until recently, current consuming devices have waxed and waned in various parts of the country. There is hardly a central station which has not at some stage found it expensive to learn just what devices or appliances, if you like, were a profitable source of revenue in its locality. It is to the credit of the commercial managers that they have invariably stood behind the good name of their company, frequently "making good" on devices when they were neither legally nor morally obliged to protect the buyer of the cheaper apparatus, much less accede to

*Advertising manager, General Vehicle Company.

the whims of the eternal feminine. (They have had to work hard, too, in developing the industrial load). It was but natural that some of them should arrive at the conclusion that it is not the central station's forte to sell merchandise. It is but natural that they should at first look askance at this electric vehicle proposition, especially when it involves larger units of energy, of capital and of responsibility. On the other hand, we manufacturers of the electric feel that we have basic problems enough of our own without being asked to shoulder the one-time delinquencies of flat-irons and toasters.

INCOMPLETE PRESENTATION; INADEQUATE CO-OPERATION.

The electric vehicle manufacturer has not always presented the electric to the central station in just the best light, and by failing to do so has frequently, in a measure, done both himself and his product an injustice. It is well to remember that the pioneer manufacturers in any field usually have a mighty struggle to make both ends meet while doing the educational work so necessary to success. Also that the late comers in a field frequently jump at conclusions and help undo much of the constructive work of the pioneer. It is important to remember this last because we have reached a point where anything done to hurt the good name of the electric vehicle injures the whole electrical industry. The speaker will have more to say of this later.

It has been practically impossible for the manufacturer to adequately present the real merits of the electric vehicle to the right man in each central station. Such a presentation implies long conferences between able men on both sides, and this is a big country. It is only natural, therefore, that with the story half told in many cities, and not told at all in many others, the idea should stick in some localities that the central station is being used as an "easy mark" and that the manufacturer has no interest other than hoodwinking the central station manager into buying ten cars, he throwing in an agency when the check comes through, or in getting him to build an expensive garage in anticipation of future business and then leaving the central station to hold the bag. (Some of you may have seen a cartoon on this subject recently.) Nothing could be further from the aim and purpose of the reputable manufacturer. The short-sightedness of such a policy becomes apparent with a very brief analysis.

At the same time we must concede that the manufacturers as a whole have not in all cases done justice to at least the commercial electric, in seeking to interest the central station in the use and exploitation of it. There have been instances where a profit of from 500 per cent to 1,000 per cent on the sale of offpeak current has been the principle argument used, and even where such profits are possible (they often are), the manufacturer's representative should not stop there. The building up of a future demand load during offpeak hours, and a reasonable assured profit *over a period of years* on the total central station investment involved, is a much more business-like basis upon which to approach the question. Some of us now feel that to the extent we have presented a mirage instead of a cold-blooded business certainty, we have justified your feeling of doubt, and your hesitancy in taking part in a proposition which to you looked too good to be safe.

One of the purposes of this paper is to correct the impression that it is the central station rather than the vehicle which is being exploited and another is to present believable facts. Still another is to make suggestions which are free from the taint of individual greed or business chicanery.

THE FUTURE OF THE ELECTRIC IN THE SOUTH.

The next decade will see a greater industrial development in the South than in any other section of the American continent. The time is ripe for it and a great many factors, economic and otherwise, make an era of prosperity certain. You are handicapped by poor roads in some sections but many of your cities have road conditions most favorable for the operation of both types of electrics. Furthermore, you have in most sections an ample supply of cheap electricity, with more available. This insures individual motor drive from the day the factory turns its first wheel instead of in the second century as happened in New England. It is a great thing from the standpoint of the electric vehicle, to have the local public accustomed to things electrical. You also have many enthusiastic young merchants who believe in having the best store and delivery equipment regardless of initial cost. Your million dollar office buildings in what we Manhattan Islanders call a small town are but indications of the spirit which does things, let old Precedent frown as she will. Other things being equal, a city of 50,000 in this new South should absorb more electrics in a year than a Northern city of 100,000 would in three years. You have your conservative element, it is true, but you have men who build $10,000,000 plants en toto with little more than their great faith in the future of the South to insure dividends. That is why the electric vehicle and the commercial electric especially, has a great future among you.

CENTRAL STATION A RECOGNIZED LEADER.

The central station occupies an enviable position in its local field; a position which gives opportunity for leadership in many things which make for the commercial growth of the community. Its position is one of responsibility to its customers as well as its stockholders. One of your able engineers has rightly said that keeping close to a customer never yet hurt a public utility. This thought has a bearing upon the exploitation or non-exploitation of the electric vehicle.

Let us assume that as yet you have not a single electric of any kind in your city. Horses and mules prevail in trucking, light delivery and general hauling. Without making any noise about it, around September first there is placed in the service of your most aggressive department store two smart 1,000-lb electric wagons. Montgomery Lee, the manager, has satisfied himself that they are what he needs to complete the service of his crack store, and while at New York or Detroit, has placed the order for fall delivery. What would you do by way of co-operating with him to insure the efficient operation of them, not with the idea of booming the electric vehicle business, but just because as a customer of yours he would naturally look to you for still more current to charge his two machines?

MUCH DEPENDS UPON INITIAL SERVICE.

Some central station managers would turn things inside out to help "Monty" Lee while others might be three months fixing him up with charging apparatus and an equitable rate. In the latter case and especially if no assistance were given Lee while his drivers were wrestling with the little mistakes incident to emergency charging during the Christmas rush, how long before the third electric would find its way to your city? Remember, every merchant is watching the radical departure from horse wagon methods; the wholesalers, too, and probably one or two factory managers. Those little

cars are on trial for their lives, so to speak, and not only those two but in the eyes of the city, *all* electrics— yes, the very principle of electric road transportation!

Assume that in addition to taking a half-hearted interest in the initial installation, the central station a year later buys several gasoline trucks for its own work? Suppose the manufacturer of the two electrics fails to give them adequate inspection? Can't you see how we are all dependent upon each other for any progress whatever in new fields?

On the other hand (and this very often happens), assume that the central station manager, having kept in touch with the development of the electric vehicle idea, had two years ago persuaded his board to allow him to purchase two light electrics for lamp distribution, etc., and he or his engineer had personally studied the performance of the two until he knew all the little kinks of operation and care. Would he have hard work to convince young Lee or any of the other live local merchants that a good electric was a fine investment, especially when rightly operated and cared for? Not on your life, because the merchant is only two willing to be guided by the central station in the adoption of things electrical. Hence, *the foundation of an offpeak load built up through electric vehicles lies in the close personal touch of the central station with the customer, rather than in the difference between* 15 *per cent and* 20 *per cent commission on the vehicle as some seem to think.*

OFFPEAK EARNINGS ALREADY HERE.

The Chicago central station already had a revenue of over $200,000 per year from the sale of current used to charge vehicle batteries on its lines. New York has even a larger revenue, and Denver is credited with a load of 2,000,000 kwh. from battery charging. These facts indicate the certainty of return on the right cooperative work with the vehicle user and the vehicle manufacturer. Bear in mind that none of these cities has more than one-tenth the number of commercial electrics needed to displace the horse in remunerative trucking and delivery; in fact, the 80-odd thousand commercial vehicles used in this country have displaced barely 2 per cent of our 26,000,000 horses and mules.

The larger the city the more congested the traffic conditions and the greater the needs for horseless vehicles. We must admit this. Yet in the aggregate the offpeak demand which may be created in our smaller cities is startling. Hartford has twice as many electric trucks as Pittsburgh, and the heaviest trucks sold to date are of 2-tons capacity. Worcester, Mass., has more heavy trucks than San Francisco. Vancouver, B. C., with a duty of 35 per cent and a freight charge averaging $200 per vehicle, has more American electric trucks than Atlanta, Milwaukee or Montreal.

A DEFINITE PLAN IMPORTANT.

Those familiar with the situation do not expect the smaller central station to build up a vehicle load all in a minute. Yet keep in mind that ten 2-ton trucks will consume on the average 60,000 kwh. per year. Then ask yourselves if it is not a very small city that cannot utilize to great advantage at least 25 commercial and as many passenger electrics.

The offpeak earnings in most of the cities mentioned are the result of constructive educational work on the consumer by the central station. A definite plan is important. The central station manager must "sell" himself the electric before he can intelligently advocate its adoption by someone else. This, gentlemen, is the reason we manufacturers ask the central stations to take their own medicine; to start off right by using electrics in their own work. You may not believe for the moment that we are sincere in this, but you will some time. If you were to sit at a desk in the central station department of the company we represent, and attempt to catalogue the different types of vehicles and the various classes of batteries which some central station engineers think the manufacturers ought to build, you might well think that we should have more missionaries at home rather than abroad. The standardized chassis can be made equally successful from an operating standpoint on the level streets of Washington or on the hills of Pittsburgh, because battery compartments are now elastic and different motors available for different conditions. It may take us only 90 days to overcome a problem of hauling ore in Idaho, and 900 days to convince some engineer that we cannot give excessive speed and abnormal mileage both in one machine.

It is not our aim to unload a certain percentage of our output upon the central station so much as it is our hope and purpose to so co-operate with the central stations that it will be possible for them:

First: To absolutely prove to their own satisfaction through machines used as substitutes for horses in the distribution of meters, appliances and supplies, and in line repair and construction work, that the electric is what we claim it to be.

Second: Having found it satisfactory in all the essentials for their own work, they can consistently endorse it for the work of the merchants and manufacturers who are now their customers.

Third: With a nucleus of customers' machines on their lines, build up a steadily increasing offpeak load which will give reasonable returns upon the total investment.

We have emphasized the importance of a definite plan and will now endeavor to show that the right plan is both possible and practical.

BUILDING FROM THE GROUND UP.

Most central stations have the shell of a garage already available in the form of an outgrown stable, warehouse, station or car barn, so the question of garaging the first electrics purchased involves no new building construction. A 1,000-lb panel body meter wagon, a 2,000-lb express type utility wagon and a platform and stake body 2-ton truck would probably make the best nucleus for average central station work. These would lost at list price (with thin plate lead batteries) between $7,000 and $7,500. A heavy duty four-circuit charging panel and three rheostats would cost about $225, and the necessary wiring, say, $50. Such equipment from 115 volt buss would care for either Edison or lead, at normal rates of charging. Thus, for from $7,500 to $9,000, depending upon battery equipment, etc., we have the first unit in a comprehensive plan for central station transportation service, and the foundation for a still broader motor transportation development in the local field.

Assuming that you have in mind an offpeak vehicle load as a goal, even while your organization is getting accustomed to the operation and care of the three machines referred, you can be winning over local public opinion to the side of the electric in an inexpensive and effective way. You can secure from the Electric Vehicle Association of America leaflets designed to educate the public in the prestige, simplicity and economy of both types. You can also secure from most manufacturers of

commercial electrics, leaflets which serve the same purpose, without mentioning the name of the truck. These can go out with your statements the first of each month, and in most cases, without additional postage. Electros of passenger electrics and trucks can be secured gratis from manufacturers, and a small advertisement can be run occasionally in the newspaper space you have already contracted for, without infringing on the space allotted to house wiring, appliances, etc. Don't be afraid to put a cut of one of your cars on a blotter or some other enclosure, as this has strong local interest. The wholesale grocer who sees an illustration of your 2-ton truck loaded with motors, wire or heavy cases in very likely to call up your superintendent and ask about its performance.

The interest in the electric is now so keen as a result of national advertising that in a short time you will have a letter from some manufacturer advising you that a live, well rated doctor or merchant in your city has written for catalogue and data and suggesting that you investigate his needs and make recommendations. In this way you should be able in a short time with the help of the manufacturer's representative to close the sale for a vehicle, and when one or two will have been placed in your city an agency will surely be established. By the time you have "sold" the proposition to your power salesman and given some pointers to the young lady at your information desk, you are not going to find it hard to get a number of good prospects for one or perhaps both types on your list. You can see that so far your promotion work has not been expensive. By the time the manufacturer, the agent and yourselves have placed a couple of trucks and some passenger cars in the town, the matter of a garage should receive consideration.

If by this time you are ready to add to your own fleet of electrics and have in mind available land upon which to erect a garage centrally located, it would equalize garage labor costs and reduce your overhead if you could build a garage to care for not only your own machines but those of a reasonable number of local users; most often your lighting or power customers. If you are garaging machines in a building which is ample only for your own use, considering future expansion. the garage proposition might be put up to some good local man who could secure sufficient backing to make the venture a success. A neutral garage, well equipped and capably managed, is usually better for the electric vehicle as a whole than one run by an agent, and much more so than a garage housing both gasoline and electric.

One good electric properly operated and cared for will almost invariably sell another. The manufacturer would get nowhere without re-order business, since the initial truck sold shows little profit, and is expensive to inspect or supervise. You know all the local business men, and by doing your best to keep each electric up to par through advice and practical engineering, you will soon have all the prospective buyers with you and so get the majority of all machines sold *on your lines.* It can't all be done in a month or a year, but it can be done to a *certainty*, and to your immediate profit, if you go about it right.

OTHER LOAD FACTOR POSSIBILITIES.

A great many electrical men stop at figuring the number of kilowatt hours possible to secure from a given number of electrics sold in their city. This is a mistake. Very often we manufacturers find merchants or factory owners who make their own current, garaging their machines with the central station. Very often, too, the factory owner warming to the spirit of co-operation shown by the central station in helping him develop better transportation methods, becomes open to conviction on the broader central station service, and the whole factory comes in on the company's lines. In other words, the electric *truck* (at least) is one of the most potent entering wedges imaginable. Remember, that today the delivery problem of the merchant or the factory owner looms very large. Anything which saves money on the short haul, as the railroad men call it, increases net profits and makes possible business expansion. Thus, the truck brings prosperity with it and makes possible larger and better stores, factory expansions and all that this implies to the organization which supplies the current for new elevators, for the individual motor drive, the conveyor system, the individual truck, the all-night sign, and very frequently, new trolley cars as they are put on to serve the growing community.

As before stated, we, together, are *selling the electric vehicle principle as well as current and cars.* In the last analysis, all things electrical are but instruments that serve this principle. If you men of large vision would look at it in this way; look at the city horse as an isolated plant; get over being awed by the gasoline vehicle; remember that you are closer to those who buy light and power from you than anyone else; that you have it within your power to practically remake your city's transportation methods—you would stop shaking your heads over vehicle design, storage battery (to you) imperfections and operating conundrums and get into the battle with your coats off. There are three billion dollars invested in the industry of which you are a part, and when this is solidly behind the vehicle, think what it will mean to our cities! The future of the electricity cannot be comprehended and the future of the electric vehicle, with its special applications, its constantly expanding field, is also beyond the limits of our day or generation.

This is why, without underestimating either the wonderful part you have had in our success, or the tasks that are still unfinished by both of us, we say that the *central station's greatest opportunity* is the *electric vehicle:*

Electrics Favored in Germany

Electric cabs are regarded with favor by the municipal authorities of Berlin, Germany, owing to their speed, convenience and cleanliness. The city is issuing no more licenses for gas or horse-drawn cabs, but is permitting three horse-cab licenses to be exchanged for one electric cab license. The batteries in these vehicles are owned and maintained by the storage battery company, which maintains large garages. When a chauffeur finds that his battery is nearly exhausted he drives up to one of these garages. Passing through the gate, his taximeter is read and he pays in the cash called for. He is then given a ticket, for which in another department he obtains a newly charged battery. The whole transaction can be carried out in two minutes, and thus the driver is not detained long from the street. Cab traffic is rigidly supervised by the city, and all vehicles are carefully inspected. Electrical energy for charging the cab batteries is sold to the storage battery company by the local electric lighting company.

An Automatic Fender for Safety First

A Device Which Eliminates Accidents and Protects the Owner From Liability

FROM the inception of the motor truck, traffic has undergone a radical change. The swift starting and stopping motor truck weighing from one to ten tons traverses our thoroughfares at a much greater speed than the average pedestrian estimates. In our larger cities where motor trucks exist in great numbers, municipal authorities have found it necessary to enact ordinances regulating traffic conditions. Nevertheless the careless pedestrian often takes a chance and sooner or later becomes injured by a fast passing vehicle. This is because of a number of reasons: first, probably the carlessness on the part of the pedestrian, and second, the carelessness on the part of the motor truck driver. At any rate injuries happen and it is no wonder that the motor truck, this wonderful factor in the delivery problem is becoming more and more disliked yearly by the general public. Yet the American public demands immediate service, the delivery today is the imperative and the motor truck is the only factor which can bring about such results.

To the owner the motor truck by its rapid delivery has showed an increase both in sales and economy in delivery; however every owner of a motor truck realizes the liability which he must assume in the ownership of such a vehicle. A careless driver at any time may cause his employer to become liable to a damage suit in thousands of dollars due to injury. This circumstance alone causes many to refrain from the adoption of motor truck service.

It must be understood that wherever mechanical apparatus self propelled is being employed there exists a certain amount of danger which cannot be avoided. Every year shows a great number of accidents incurred by street cars, railroad trains, elevators and other motor driven apparatus. We must naturally

The Safety Fender Equipped on a Columbus Electric Passenger Car.

infer then that the motor truck must have its list of victims each year. Consequently the problem is to avoid as many accidents as possible. In this connection many of our larger cities have demanded the use of fenders on all motor trucks. Detroit and Chicago have already put through an ordinance to this effect. Many have experimented with various type fenders, some satisfactory and others of no special value except that they keep the motor truck owners within the statute. In our larger cities where traffic

Linquist Safety Fenders for Trucks.

is congested many have even equipped their passenger vehicles with fenders principally because they do not wish to expose themselves to unnecessary liability.

In view of insuring safety and a saving in life, time and money, William A. Lindquist of Minneapolis, Minn. has placed on the market an automatic fender which can be automatically lowered in case of emergency. The fender is neat in appearance, light in weight, and can be attached quickly to any vehicle either commercial or passenger. It extends for thirteen inches forward and is constructed of the very best steel. The fender can be lowered before striking the object by means of a foot trip-lever; consequently many injuries can be avoided whereas without the fender the vehicle would be obliged to run over the object before coming to a perfect stop. It is a known fact that fenders on street cars have been a wonderful device and have saved many lives. We have every reason to believe that a fender for motor trucks would do the same duty to the public. Accidents often occur entirely beyond the responsibility of the motor truck driver. In such cases the injured often brings the truck owner into court and the result is a long legal fight at a great expense. Although the motor truck equipped with a fender is not free from all possibility of causing injury, nevertheless such a truck owner has a greater advantage, if it can be proven that his vehicle was equipped with all modern devices for the prevention of injury.

The great "safety first" movement which is prevailing throughout our country is causing many to enroll in preservation of life and elimination of accidents. Pursuing an aggressive campaign for greater safety in motoring, and general use of the public highways,

the Safety First Society of New York has hit upon a decidedly original and unique idea. This is to be a nation-wide touring campaign with an automobile equipped with reliable devices, including a fender, which tend to make motoring safe.

This car will be started on an extended tour of the eastern states and later continue on through the South and far West. It will carry representatives of the Safety First Society who will use unique methods of preaching the gospel of caution and carry the message of "safety first" to motorists and other users of the highways along the entire route. The members of the expedition will call on city officials and prominent citizens in each city visited, with the object of inspiring interest and closer co-operation in the cause. In many cases aid and suggestions will be offered by the society's representatives to communities that are interested in co-operating by forming local Safety First societies. Lectures will be delivered by the society's representatives and as the tour will be given wide publicity it is hoped that it will directly result in more intense interest in the great national campaign to curb recklessness and to minimize the number of preventable automobile accidents and fatalities.

States to be covered by the tour include New York, Connecticut, Rhode Island, Massachusetts, Pennsylvania, Ohio, Michigan, Indiana, Illinois, North Dakota, South Dakota, Kentucky, Tennessee, Alabama, Georgia, North Carolina, South Carolina, Virginia, Washington, D. C., and later into the Northwest and Pacific Coast.

That such a campaign will do much of decided benefit to the public at large as well as to the automobile industry is obvious and there is practically no limit to the field of operation.

By the use of safety devices and this remarkable fender ninety per cent of all accidents can be eliminated; the owners' liability decreased and the motor truck considered more as a necessity than as an impediment to public safety.

Cost of Keeping a Horse in Boston

Maintenance of a horse cost $1.535 per day in the Public Works Department of the City of Boston, Mass., according to an annual report recently published. This figure is based upon 177.05 horses kept in the seven department districts of Boston during the 366 days of the year ending December 31, 1912.

Average number of horses kept	177.05
	Cost per horse per day
Labor, stable, hostlers and stablemen	$0.518
Hay and grain	.636
Stable fuel, light and rent	.080
Shoeing	.119
Stable repairs	.038
Veterinary services and medicine	.013
Harness furnishings and repairs	.095
Hire of driving horses	.013
Outside board and care of horses	.022
Miscellaneous	.001
	$1.535

The above items include only those which enter into the actual maintenance of the horses. For the purpose of comparing the cost of maintenance of horses in that department with the cost of maintenance of any motor trucks which might be subsequently bought, the table is of little value because the items of interest on investment and of depreciation of horses, harness and wagons are not included.

The cost of $1.535 per day for the items given is high in comparison with the cost of maintaining horses in New York City. The cost per day of upkeep of an ordinary draught horse as kept in a stable of twenty such horses on the upper west side of New York City was $1.327, including $0.226 for horse and harness investment and for horse and harness depreciation.

Subtracting this sum from the total of $1.327, the figure comparable to that of $1.535 is $1.101, or $0.434 per day less. The greatest difference in the cost of upkeep in the two cases is in the item of cost of labor of stable hostlers and stablemen. In the New York stable, although it housed only about one-ninth the number of horses, the cost per horse per day was only only $0.20, while in Boston the cost per day for the same work was $0.518, or more than twice as much. Perhaps this large difference is most easily explained by the fact that in the former case the horses were privately maintained and in the latter, city maintained.

The figures for feed in the two cases agree fairly closely, the cost per day in New York being $0.60 per day for the items of hay, oats and straw as compared to $0.636 per day for the same items in Boston. The remaining figures for the various other items are also about the same and indicate that the cost of maintenance per horse per day does not vary to any great extent in any of the large cities of the country.

San Francisco Motor Truck Club

With a view to bringing the motor truck into more general use in San Francisco, a motor truck association has recently been formed under the name of the Motor Truck Dealers' Association. Pleasure cars have long been extensively used in this city and throughout the state and it is felt that the truck association can soon bring the commercial vehicle into as large proportionate use as is now enjoyed by the pleasure vehicle.

The by-laws and constitution of the new organization are concise and aimed at a business basis that should result in good work. J. F. Larkin is president. He says the purpose is pure business established along right lines for the benefit of all concerned. Watt Moreland is vice-president. He was selected to handle the legislative business of the association. He expects to take up a campaign for better conditions in every line of the motor truck industry and will visit several of the larger cities of this country to study the rules and regulations which govern commercial vehicles.

Statistics on Parcel Post

The Electric Vehicle Association of America has recently issued some interesting parcels post statistics contemplating the use of the electric vehicle in this branch of government service. In fifty cities, having a combined population of 20,000,000, 11,000,000 parcels were mailed, and 3,500,000 parcels were received, for local delivery, from October 1 to October 15 last year. They weighed on the average, one pound and eleven ounces, and paid 10 cents postage each. Three quarters of this mail was handled by regular carriers, and about 10 per cent, or 350,000 parcels, were delivered by automobiles, at a cost of $17,653.

100-Mile Fritchle Competes in Gas Car Tour

Electric Roadster Proves Capability of Negotiating All Obstacles of Cross Country Roads

BY O. P. FRITCHLE

ONE evening previous to the big automobile Derby for gasoline cars, I stood watching the big generating motor in my garage, when I was startled by the cheery greeting of an enthusiastic friend of the Fritchle car.

"Well, O. P.," my friend remarked genially, "you haven't pulled off a stunt with the Fritchle in some time now; what's the matter—don't you know of anything else you can do with your car that the other fellow can't do with his?"

"I've done enough, haven't I, already?" I asked.

"Yes, undoubtedly," was the reply, "but I believe you have one of the best opportunities you've ever had staring you in the face."

"So? What is it?" I asked.

"Why, enter the automobile Derby that starts on July 3—that would be easy for you, and carries with it the advantage that in making such a run as they are going to make, from Denver to the Springs, then on to Canon City, and then to Pueblo and back to Denver, you will not only go nip and tuck with the gas cars, an opportunity you have always longed for, but there will be witnesses, man, witnesses to the fact that you made that run, and forever doubting Thomases will have to hold their peace!"

As I remarked above, this friend is a Fritchle enthusiast, but his enthusiasm is practical. In his enthusiasm he had looked out for my interests better than myself. I saw at once that he was right. Here, indeed, was the opportunity I had long sought.

"Come on, O. P.," he continued, grasping my arm and rushing me toward a coupe standing near, "let's go down to the Motor Club at once and enter the Fritchle car."

In a few moments we were in the office of the secretary of the club, and I had signed my entry blank for the run.

Now for the fruits of my friend's timely suggestion.

On the morning of the third of July I started, the only electric automobile entry in the event, for Colorado Springs, seventy-five miles away, through sand climbing over two thousand feet higher in altitude. But this part of the run was no novelty to me. As everyone knows who has followed the career of the 100-mile Fritchle electric, I have made the run from Denver to Colorado Springs on one charge so often that the accomplishment has ceased to be a novelty.

O. P. Fritchle and the Record Making Electric.

The only difference in making the trip this time was that the route lay through Castle Rock. I had never been that way before, it being two or three miles longer than the way I had always gone—through Perry Park.

The roads were ordinarily good, and I made the Springs in three hours and fifty minutes, where I recharged a while for the 55-mile run to Canon City.

Starting for Canon City, I found myself on a road new to me. While the distance to Canon City from Colorado Springs is less than from Denver to the Springs, there are many bad hills, and, to add to this difficulty, many of the hills had sharp turns; so that, everything considered, it required as much expenditure of power to make the fifty-five miles to Canon City as to make the seventy-five miles from Denver to Colorado Springs. A comparison of the time of all cars for this leg will show this to be true.

My running time for the fifty-five miles to Canon City was three hours and five minutes.

Along with the rest of the party, I enjoyed the hospitality of the Canon City folks, and turned in for a night's sleep preparatory to the run next morning to Pueblo, via Florence.

At Canon City the driver of one of the smallest cars entered made the remark to me that he would wager no one made the run from Colorado Springs to Canon City on less fuel than he had used.

In answer to my question as to the amount, he said he had used six gallons of gasoline and a quart of oil. Figured out in dollars and cents, this much gasoline and oil cost him $1.40.

The cost of the necessary electrictiy for me to make the run from Colorado Springs to Canon City was thirty-six cents!

The next morning—the morning of the glorious Fourth—my roadster lined up with the gas cars for the forty-five-mile run to Pueblo. There was nothing, apparently, to cause any apprehension. But soon the raindrops commenced coming down, and the horrors of a wet adobe road pictured themselves to us all. It rained nearly all the way, but only once during the trip did I have to resort to anything to help matters and that was to wind a rope around one of my rear wheels to get up a slippery adobe hill. Incidentally, I might say that this, outside of having one puncture, was the only trouble I had to "shoot" on the entire trip.

A royal escort of Pueblo Good Roads Boosters met us a few miles out from Pueblo and formed our guard of honor

for the triumphal entry into the Pittsburgh of the West.

My time from Canon City to Pueblo, forty-five miles through rain and mud, was three hours and ten minutes.

More hospitality at Pueblo and another good night's sleep, and the morning of the fifth dawned upon us. Saying good-bye to our Pueblo friends, we started back to good old Denver.

I made the forty miles to Colorado Springs in two hours and seventeen minutes, and from there into Denver I was again on familiar ground, making the run in four hours and twelve minutes.

Tired, dust-covered and sun-burned, I put my roadster in the garage and repaired to the banquet at the Savoy, where the presentation of cups was to be made.

I had no idea that I would win a cup, the time for each leg of the trip having been set on a basis of time that would be made by gas cars. However, I lost one of the cups by the slight margin of only seven minutes.

For the information of the reader, I will explain that the prize cups were awarded to cars running nearest to a secret time schedule that had been agreed upon in advance by a committee. Each member of the committee set what he thought would be a safe speed to make over each leg, and an average was struck, the car making each leg closest to that average being declared winner of the cup.

But I did not enter to win a cup, though, of course, I tried. The faster time of gas cars, theoretically speaking, was against me—but was it, after all? A glance at the time, as shown further, will show that I had nothing to blush for in this particular.

I could have made faster time, but, so much of the road being new to me, I did not know when I might have to tax my battery to the utmost to overcome hills, sand or mud.

As it was, I finished each leg of the trip with at least 30 per cent power left.

My greatest satisfaction was in knowing that, under the eyes and auspices of the Denver Motor Club, my Fritchle car had given proof that it could negotiate the country roads in full accordance with my claims. As my friend had said I would do, I proved to these men that the electric is strong, speedy, and capable of great mileage.

My trip from Lincoln, Nebraska, to New York City and Washington, 2,140 miles, made in the winter time, across the Allegheny Mountains, a few years ago, averaging more than ninety miles a day, was an achievement proper credit for which I have never received from western people. Why?

For the reason that *they didn't see me make it!* That trip was so absolutely beyond anything that had ever been attempted before by electric automobile manufacturers that seeing only was believing.

I have made the trip to Colorado Springs on one charge time and again, yet there has always been a large enough proportion of doubting Thomases to detract from the credit of success which, to me, with a Fritchle car, is positively easy to attain. Why?

Because our good people did not see me make the trip!

We must always make proper allowance for human nature—human nature must be served. The recounting of an achievement that has always been regarded as an impossibility must, I admit, be accompanied by positive proof to be believed by those whose ideas of limitations are strongly intrenched.

But, from now on, who can withhold the credit that is due the electric for the showing of the 100-mile Fritchle electric automobile in the recent Derby, made, as it was, under the eyes and auspices of the Denver Motor Club, whose membership will cheerfully attest that a 100-mile Fritchle electric made the trip nip and tuck with the gas cars?

There is still one loop-hole through which doubt may enter—I am going to close that loop-hole here and now.

There will be some who will say that I used a special battery. To you who are going to be strongly influenced in favor of the electric car by its performance in the trip just recounted, let me say that I made this trip in a stock car—the battery exactly the same capacity of battery that you will get in your car.

STATISTICS OF THE RUN.

Total distance, 280 miles. Route: Denver to Colorado Springs; Colorado Springs to Canon City; Canon City to Pueblo; Pueblo to Colorado Springs; Colorado Springs to Denver.

COMPARATIVE TIME.

First leg, 74 miles—	
Fastest time of gas car (Chevrolet)	3:02
Time made by Fritchle Electric	3:50
Second leg, 54 miles—	
Fastest time of gas car (Franklin)	2:44
Time made by Fritchle Electric	3:05
Third leg, 46 miles (almost all of this distance was made through rain and adobe mud)—	
Fastest time of gas car (Abbott Detroit Six)	1:54
Time made by Fritchle Electric	3:10
Fourth leg, 42 miles—	
Fastest time of gas car (Chevrolet)	1:35
Time made by Fritchle Electric	2:17
Fifth leg, 72 miles—	
Fastest time of gas car (Chevrolet)	3:00
Time made by Fritchle Electric	4:12

COMPARISON OF TOTAL ELAPSED TIME.

Total elapsed time of fastest gas car (Cadillac), for entire trip of 280 miles	14:06:15
Total elapsed time of Fritchle Electric	16:34

Providence Has New Charging Rate

A new charging rate is now in force in Providence, R. I., and adjoining towns served from the lines of the Narragansett Electric Lighting Company.

This rate is known as "storage battery and irrigation rate H" and is used for irrigation propositions and for charging storage batteries. For the first 100 kwh. of charging service the customer pays 5 cents a kwh. For the next 200 kwh. consumed the rate is 3 cents per kwh. For everything over this amount or everything exceeding $11.00 per month, the rate is 2 cents per kwh. No bill of less than one dollar per month is rendered, and for installation from 2 to 10 H.P. the minimum charge is 50 cents per horse-power per month but in no case exceeds $5. per month.

Spokane Still Has First Electric

The first electric automobile ever driven in Spokane has now become the property of the Hawkins Motor Company, agents for several makes of electric machines in this territory.

The machine dates back to 1907, and is the product of the Baker Electric Company. When it arrived in Spokane it was one of the finest machines in the city, and created such a sensation that when it passed down the street people turned to stare at it.

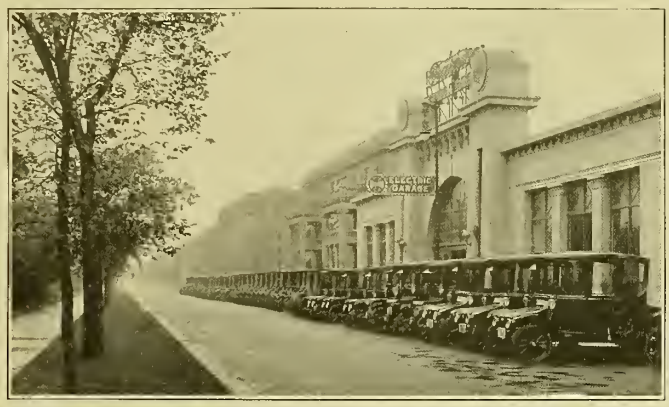
The old machine is in good condition yet, and is used daily at the garage as a service machine.

An Electric Car Agency as a Side Line

An Opportunity for the Local Garageman to Turn His Spare Time into Money

BY H. L. GOODWIN

FROM the standpoint of electric car salesmen, the local garage man occupies a most enviable position. "William H. Jones, proprietor of Jones' Elite Garage," almost anywhere represents a distinct type of business man. He knows all the people in his town of sufficient importance to own an automobile. He is familiarly known to patrons of his garage, and others alike, as "Bill Jones." What "Bill" is not supposed to know about automobiles is not worth knowing. When he expresses his views on anything connected with the automobile industry he is given a most respectful hearing. Probably better than any one else in the average community, the type represented by Bill Jones, this garage man knows who are in the market for electric cars. He at least has a pretty accurate idea of who might be interested in a car, if a carefully managed campaign of education was promoted. The very nature of his work, coming as he does into almost daily contact with large numbers of his customers, gives him a good deal of special information which is worth much to any electric car salesmen.



Forty-six Woods Electrics Kept at the Fashion Garage, Chicago.

The garage man has opportunity to learn the needs, likes, dislikes and opinions of the car-buying class. To a great extent he is in a position to mold that opinion, to change the likes and dislikes. His position really gives him inside information which is a valuable asset and a by-product of his garage business which would be wasteful not to utilize in some way.

Many of the most successful garage men in the country have taken advantage of this feature of their business and turned it into good account. Ordinary business foresight should make clear to every garage man the importance of using his position and the special knowledge accruing to it for his own profit, and that of those he serves. By thoroughly investigating the various cars on the market and accepting the agency for the one which his judgment tells him to be the most satisfactory, he can promote the best interests of his customers. At the same time he is earning worthy commissions for himself.

It is seldom that his profit from the sale will be limited by the commission he receives from the manufacturer. Having made a pleased customer by the sale of a satisfactory car, it is only natural that the owner should bring the car to his garage for service. Thus he has made not only a profitable sale, but a steady patron for his principal enterprise—the garage.

It might pay the garage man located in a large city to employ a capable man to handle his electric car agency under his immediate personal direction, or more often, perhaps, he can do all the work himself without sacrificing any time necessary for the proper supervision of his garage.

Unquestionably the average garage man is quite well posted on the character of the cars kept in his establishment. Before accepting an agency, however, it would be well for him to secure information in regard to all makes of electric cars. He ought to know something about each of the different cars, their record for standing up and giving service, as well as the reputation and present standing of the manufacturer. He should insist upon hearing and seeing all sides of the question as to which car gives the best all-around service to the owner. This is a question quite apart from that of mere external appearance, body lines, trimmings, etc., and one deserving of unusual critical investigation.

The electric car should be chosen much in the same way as you would pick out a superintendent for a very responsible position. Look up its record for service, but don't make the mistake of selecting a "has-been." There is a decided difference in the character of the various electric cars, within the different range of price, even more than in gasoline machines. It is of the utmost importance, therefore, that the prospective agent thoroughly post himself before deciding which car to recommend to his patrons.

The high grade electric car of today is truly a masterpiece of engineering skill and modern manufacturing facilities. It is as staunch as a battleship, with as many graceful lines as a cup defender. It will give service 25 per cent more days in the year than a gas car, and will continue to give that service two or three times as many years as a gas car of the same class. The low rate of depreciation on an electric car is, however, but one of the several factors

that make for the economy of its operation. The downward trend of prices for electric current compared with the aviating tendency of gasoline is another. The satisfactory use of solid rubber cushion tires on the electric car, made possible by special attention to spring and chassis construction for such tire equipment, is still another factor which not only cuts down the expense, but makes complete the thorough dependability of the electric. This is one of the exclusive characteristics of the electric which has much to do with its rapidly increasing popularity in all quarters.

At present women have much to do in the choosing of the electric, probably to a much greater extent extent than in the gasoline car field. On the other hand, a large number of men who buy electric pleasure cars on account of their own personal preferences is being increased by large numbers each year. The predominant qualities of the electric which appeal to men quite as much as to the women are many. They include instant readiness; dependability; cleanliness; freedom from tire trouble; the elimination of all engine trouble; practical independence of weather conditions; freedom from disagreeable odors, noise, dirt and grease. The speed and mileage of the modern electric are more than equal to the requirements of the city or suburban man or woman.

A good percentage of the men as well as a very large number of women who buy electric cars, either could not be induced to buy a gasoline car or they already have a gasoline machine. This means that the man who handles electric cars in addition to an agency for gasoline machines will find a great many sales of electric cars coming to him easily which he would never have been able to close for gas cars. This is like so much "velvet" which requires very little extra effort to secure. Looking at the matter in its broadest aspects, the garage man is the logical man to push the sale of electric cars for two principal reasons: First, because he knows the market, at least to the extent of being in a position to cultivate it most effectively; second, he is vitally interested in having the patrons of his garage supplied with cars of the most satisfactory and serviceable character.

The garage men are as a class keenly alive to the rapidly speading appreciation and consequent demand for the electric. Every year adds many to the list of garage owners who are handling electric cars as a side line. The fact that probably eight out of ten regular agencies for electric pleasure cars are in the hands of men operating public garages shows the combination is a good one.

The exact value of the electric to the garage owner has been thoroughly demonstrated. There are many garages which were originally equipped to care for gasoline cars only. Finally the electric was accepted; garages soon became known as gas-electric. And today these same garages in many instances are exclusively electric. The cause for such a radical change of policy has certainly been instigated by a powerful factor. On analysis we find that these same garage men find the electric a greater revenue, constantly in service and great in numbers. The vehicles themselves are small compared to the gas car, and consequently can be housed in less space, yet with a better revenue than could be received from the dirt-creating gas type.

Practically every garage which has undergone this evolution is an agent for some standard reliable type. Sales bring greater sales and the garage man finds selling quite as profitable as garaging.

War and Its Effect on Tires

H. S. Firestone, president of the Firestone Tire & Rubber Company, recently stated that the crude rubber situation due to the tie-up of navigation caused by the European war is now most serious. He stated that over 60 per cent of the crude rubber used in the United States for the manufacture of tires comes from the Far East, via the Red Sea and the Mediterranean. No merchant ships are now passing through these seas, so that the only method of receiving rubber from the Far East would be by diverting the shipments via the Pacific Ocean to our western shore. This change would require considerable time so that in the interval we must look to South America for temporary relief. Here the conditions are almost equally as bad, according to Mr. Firestone, who says that there are only a few hundred tons in stock in the Brazilian district because this section has a steady market for all it makes during the open season.

Recent consular reports from that country state that there is plenty of rubber on the market, but no ships to transport it to this country.

The only things which will relieve the present lack of shipments will be some decisive change in the war situation or more American ships in the South American trade.

The following table shows the increases in prices of the various companies by percentages:

Company	Pneumatics	Solids
Advance Tire Sales Co.	10	..
Ajax-Grieb Rubber Co.	Same	Same
Englebert Tire Co.	10	..
Federal Rubber Mfg. Co.	12½	Same
Firestone Tire & Rubber Co.	15	10
Jas. L. Gibney & Co.	..	10
B. F. Goodrich Co.	12½	10
Goodyear Tire & Rubber Co.	20	20
Kelly-Springfield Tire Co.	Same	Same
McGraw Tire & Rubber Co.	..	Same
Motz Tire & Rubber Co.	..	Cushion 20
Polack Tire & Rubber Co.	..	10
Republic Rubber Co.	Same	Same
Swinehart Tire & Rubber Co.	15	15
U. S. Tire Co.	12½	15

Electric Truck Distributes Pictures Films

The motor truck is not only a big aid in business, but it is also beginning to play a part in furnishing pleasure and enjoyment to thousands of patrons of the moving picture theaters.

Taking advantage of the speed of the light electric truck, the Empire Service Corporation of New York has been formed to distribute films for the big film companies among the many moving picture theaters in the metropolis.

After a film has been shown in one theater it is quickly transferred to a waiting truck and immediately rushed to a house farther down town. In this way, patrons of many houses are able to view up-to-date films on the same evening.

The first electric motor truck purchase of the Empire Service Corporation was ¼ ton G. M. C. model; and with the facilities provided by this machine and others which have been added a film may be shown in a Harlem House one-half hour after it was thrown on the screen in a Brooklyn house.

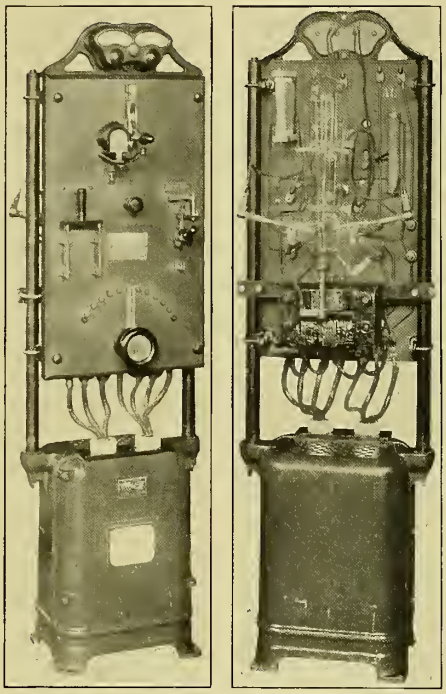
Charging the Electric at Home

A Discussion of the General Electric Runabout Type Rectifier, Its Advantages and the Theory of Its Operation

BY J. H. DOUGHERTY

THERE are many women owning electric runabouts, stanhopes and broughams, who do their charging at home with mercury arc rectifiers, and to encourage this class of charging of electric pleasure vehicles, a rectifier has been designed which in simplicity of operation compares very favorably with the operation of a battery-charging rheostat, and yet has all the range of voltage necessary for the batteries for which it is designed.

This type of rectifier, on account of the work for which it is designed, has been designated as the "runabout type," and is made by the General Electric Company. It is built with a minimum number of parts, and is as near absolute simplicity as seems possible in a device which not only changes alternating current to direct current, but must be equipped with means for regulating the charging current. In the runabout type rectifier there is a main reactance, the winding of which is equipped with four taps which make possible the connecting of the rectifier for various direct current voltages covering a range sufficient to charge all the ordinary lighter electrics. The main reactance, designated the compensating reactance, stands on the floor. The top contains two receptacles for receiving the two panel pipe supports on which is mounted the rectifier panel. On the back of the panel is a suitable holder for the rectifier tube. For use in rocking the tube, a small handle is mounted on the front of the panel. The panel is equipped with a main line switch, a single-pole circuit breaker for protection against overload, and a starting switch for connecting the rectifier temporarily to the starting resistance load.



Front and Back View of G. E. Rectifier.

To obtain a regulation of the charging current, a reactance coil is connected in series with the alternating current supply. This coil has eleven taps connected to as many buttons of a semi-dial switch similar in many respects to the ordinary rheostat switch. This makes it possible to efficiently vary the charging current and voltage over the entire range required by any battery which the rectifier is designed to charge. In order to minimize the cost, this type of rectifier is not regularly equipped with ammeter or voltmeter, although is can be so equipped.

Capacity:—The runabout type of rectifier is designed for operation on 60- to 140-cycle, 110- or 220-volt alternating current supply.

Multiple Operation:—When it is desired to charge at a higher rate than the maximum capacity of a single rectifier tube (50 amperes), two or more rectifiers can be very satisfactorily operated in multiple. The standard panels before described can, with a few slight changes, be readily adapted for multiple operation.

Automatic Starting Device:—An electro-magnetic starting device may be placed on the mercury arc rectifier panels if desired, and is particularly useful where large fluctuations or momentary interruptions, sufficient to stop the arc, are liable to occur in either supply or load. This device rocks the tube and starts the arc automatically.

THEORY.

Before describing the various types of rectifiers, a few words in reference to the theory may be of interest, and will be of assistance in describing the various types of rectifier sets mentioned later.

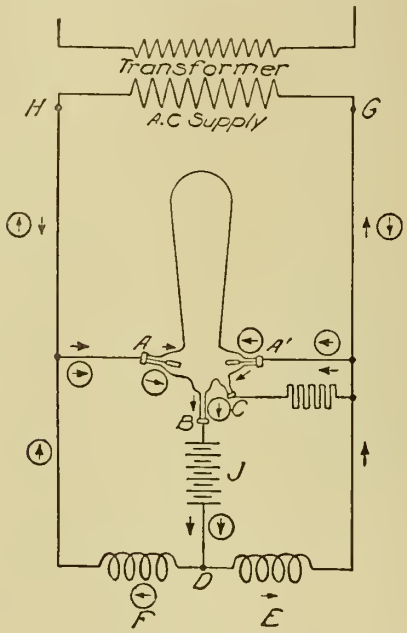
All types of mercury arc rectifier have three essential parts—the rectifier tube, the main reactance and the panel.

The rectifier tube is an exhausted glass vessel in which are two graphite electrodes (anodes AA′) and one mercury cathode (B). Each anode is connected to a separate side of the alternating current supply, and also through one-half of the main reactance to the negative side of the load. The cathode is connected to the positive side. There is also a small starting electrode (C) connected to one side of the alternating current circuit through resistance, and used for starting the arc. When the rectifier tube is rocked, so as to form and break a mercury bridge between the cathode "B" and the starting anode "C," a slight arc is formed. This starts what is known as the "excitation" of the tube, and the cathode begins supplying ionized mercury vapor. This condition of excitation can be kept up only as long as there is current flowing toward the cathode. If the direction of supply voltage is reversed, so that the formerly negative electrode, or cathode, becomes positive with the reversal of the alternating current circuit, the current ceases to flow, since, in order to flow in the opposite direction, it would require the formation of a new cathode, which can be accomplished only by special means. Therefore, in the rectifier tube, the current must always flow toward the cathode which is kept in a state of excitation by the current itself.

Such a tube would cease to operate on alternating current voltage after one-half the cycle, if some means were not provided to maintain the flow of current continuously toward the cathode.

The maintenance of the current flow is accomplished by the main reactance. As the current alternates, first one anode and then the other becomes positive, the current flowing from the positive anode through the mercury vapor, toward the cathode, thence through the battery, or other load, and back through one-half of the main reactance to the opposite side of the alternating current supply circuit. As the current flows through the main reactance, it charges it, and while the value of the alternating wave is decreasing, reversing and increasing, the reactance discharges, thus maintaining the arc until the voltage reaches the value required to maintain the current against the counter e.m.f. of the load, and reducing the fluctuations in the direct current. In this way, a true continuous current is produced with very little loss in transformation.

That there may be no misapprehension, particular attention is called to the fact that the rectifier is so designed that the entire alternating current wave is



General Arrangement of the Current.

used. This, of course, means that the rectifier has approximately twice the efficiency that would be obtained if only one-half of the alternating wave were used.

To get an idea of the operation of the mercury arc rectifier, assume the instant that the terminal "H" of the supply transformer is positive, the anode "A" is then positive, and the arc is free to flow between "A" and "B." Following the direction of the arrow still further, the current passes through the battery "J," through one-half of the main reactance coil "E," and back to the negative terminal "G" of the transformer. When the impressed e.m.f falls below a value sufficient to maintain the arc against the counter e.m.f. of the arc and load, the reactance "E," which heretofore has been charging, now discharges, the discharge current being in the same direction as formerly. This serves to maintain the arc in the rectifier tube until the e.m.f. of the supply has passed through zero, reversed and built up to such a value as to cause the anode "A'" to have a sufficient positive value to start the arc between it and the cathode "B." The discharge circuit of the reactance coil "E" is now through the arc "A'B" instead of through its former circuit. Consequently the arc "A'B" is now supplied with current, partly from the transformer, and partly from the reactance coil "E." The new circuit from the transformer is indicated by the arrows enclosed in circles.

Electric Taxicabs

So far there has been no great development in the use of electric vehicles for taxicab service in this country, but there are substantial reasons to believe that this field will be successfully invaded by the electric vehicle in the near future.

It is of interest to know that in Berlin there are over 600 electric taxicabs, as compared with 1,600 gas-driven cabs and 2,500 horse-driven cabs.

The electric cabs are regarded with favor by the municipal authorities owing to their speed, convenience and cleanliness. They can make twenty-five miles an hour. The rumor to the effect that Berlin would not license any more gasoline cabs led to an inquiry by the executive secretary of the Electric Vehicle Association of America, and the Director of Police in Berlin wrote A. Jackson Marshall under date of July 28 as follows:

> In reply to your inquiry of June 27, I beg to inform you that it is not intended here to license electric cabs exclusively in the future. However, the number of gasoline driven cabs has been limited, but within this limit gas driven cars may be set into operation. This ordinance, in the first place, has not been promoted exclusively from considerations of public health. It will eventually help the introduction of electric cabs and at the same time prevent the introduction into public circulation of a number of gasoline driven cabs in excess of public necessity.

To some people such extensive use of electric vehicles for taxicab service will come as a surprise, because in this country the gasoline propelled vehicle in this class of service is general.

However, the experience of European cities in the successful operation of electric taxicabs is appreciated, and ere long the electric taxicab with all of its convenience, comfort and economy, will be a familiar sight in the cities of this country.

Wagner Charging Converter

Wagner Electric Manufacturing Company, of St. Louis, Mo., a prominent manufacturer of alternating current motors and transformers, has perfected a simple and compact alternating current converter for charging electric vehicle storage batteries. The converters are designed for use in both public garages and in private garages.

The converter and its controlling panel on which is mounted the necessary switches and instruments, may be placed in any convenient spot and its operation is exceedingly simple.

Electric vehicle interests will be interested in this compact little unit, and Bulletin No. 103 B, which fully describes it, will be sent to anyone by addressing the above company.

Nowhere in the United States were people so slow to appreciate the true value of the electric car as in New York City, but during the past year the automobile public has had an awakening—it has investigated and found that the modern electric car is truly an eye-opener, and has competed favorably with gasoline cars.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees, and New Announcements

BY A. JACKSON MARSHALL

At a special meeting of the directors of the Electric Vehicle Association of America, held in the office of President Frank W. Smith, August 25, at 3:30 P. M., the following business was transacted:

Minutes of the last board of directors meeting, held July 15, were approved as presented.

CONSTITUTION AND BY-LAWS REVISION COMMITTEE.

Frank W. Frueauff, chairman, in presenting the report of the committee stated that he had hastily gone over the revisions, suggested by the general office, and a second draft was presented for discussion. A copy of this draft was in the hands of all the directors present, and was carefully gone over and a number of suggestions offered, which Mr. Frueauff, it is understood, will incorporate in a further draft, which will be sent to all the directors and active members for consideration at an association meeting to be held in September, so that the constitution and by-laws as finally adopted may be effective at the forthcoming convention.

E. V. A. and Chicago Garage Owners Tug-of-War.

CHICAGO SECTION.

An Executive Committee meeting was held on August 18, at which time the Chicago section adopted the revised drafts of the constitution and by-laws.

The Traffic Regulation Committee's report showed that this committee had been trying to effect a meeting of all similar committees in allied associations, for the purpose of deciding upon the best remedy for the automobile parking situation.

The Membership Committee reported that little could be done in the way of new members at present, as there seems to be a lack of co-operation among automobile salesmen and accessory men, probably due to the rift in the Chicago Garage Owners' Association.

The last section meeting was held on September 1, when E. W. Lloyd, general contract agent of the Commonwealth Edison Company, gave a talk on electric vehicle practice in Germany, and the Electric Vehicle Association's film, "Selling Electric Vehicles," was shown.

Mr. Salvat suggested that Mr. McDowell, chairman of the Chicago section, write a letter to some one of the seceding members of the Chicago Garage Owners' Asosciation, with a view to mediating their alleged grievances and getting them back into the association.

Four applications for new members were approved by the committee.

Mr. McDowell stated that he was writing a report for the Philadelphia convention.

The convention adjourned at 2 P. M.

NEW YORK SECTION.

The first organization meeting of the New York section of the Electric Vehicle Association of America was called to order by Ellis L. Howland, after which Frank W. Smith, president of the national association, was elected temporary chairman, and David F. Tobias temporary secretary.

Mr. Smith briefly reviewed the work and ends of the organization in petitioning a New York section and proceeded to appoint a nominating committee which had Messrs. P. D. Wagoner, F. F. Sampson, S. C. Harris,

Chicago Garage Owners' Ball Team.

E. V. A. Ball Team.

E. L. Howland and H. R. Leisk named as its members.

During the withdrawal of the nominating committee, the executive secretary, A. Jackson Marshall, made a few remarks touching upon the progress of the work in his office, the changing in location to larger quarters in the Engineering Societies' building and the increase in membership to date.

P. D. Wagoner presented the report of the nominating committee, which was duly seconded, and the temporary secretary was instructed to cast the ballot of one vote for the ticket as given herewith:

Harvey Robinson, chairman, D. O. Fenner, vice-chairman, and David F. Tobias, secretary. The executive committee is composed of W. C. Andrews, T. C. Martin, S. W. Menefee, Nathaniel Platt, F. F. Sampson, Frank W. Smith, S. G. Thompson, and Charles A. Ward.

Harvey Robinson, chairman for the ensuing year, then took the chair and made a few brief remarks expressing his appreciation of the honor and the desire for enthusiastic and constructive effort toward making the New York section not only the largest in numbers, which

Arguing With the "Ump."

it is, but the greatest by the results of its work. The membership of the New York section is over 200.

DETROIT SECTION.

The organization meeting of the Detroit section occurred on July 17, at which time the following officers were elected:

J. W. Brennan, chairman, W. J. Gordon, vice-chairman, and Hal C. Smith, secretary.

The executive committee is composed of Miss Sarah M. Sheridan, C. W. Terry, Hal C. Smith, A. C. Downing, W. H. Conant, W. J. Gordon and J. C. Ayers.

MOTION PICTURE FILM COMMITTEE.

This committee has received a number of requests for the use of the motion picture film, "Selling Electric Vehicles," and arrangements were made for its display at the Chicago section meeting on September 1, the Vermont Electric Association on September 17, the Kansas Gas & Electric Company on October 1. It is also understood that the National Electric Light Association will purchase one set of these films for use by its association.

Passenger Vehicle Pamphlet.—A very attractive, three-colored, four-page inexpensive pamphlet has received very favorable recognition. The text, which has been made terse and informative, is here indicated:

THE ELECTRIC FOR BUSINESS AND PLEASURE.

Speed.—More than you can use in the city; all you'll ever require in the country. The electric is as adaptable in its range of speed as any other type of car.

Power.—Real hill-climbing ability. The electric vehicle will travel 50, 75, 100 or more miles per charge, according to battery equipment.

Charging.—Press a button. The rest is largely automatic. Simplicity itself and absolutely clean. Batteries can be charged with large amount of current in a short time or a small amount in a longer time (over night when not in use). For instance, if touring, batteries can be charged while you are at luncheon.

Garaging.—At home? Yes! And simple and clean. At public garages (look for Official Garage and charging stations signs of the Electric Vehicle Association), excellent and inexpensive service may readily be obtained.

Economy.—Mile for mile, all things considered, the electric vehicle is the cheapest car to run. Its low operating cost will be a pleasant surprise to you.

Tires.—The electric vehicle is easy on the roads, therefore easy on tires. Its tire costs are comparatively insignificant.

Reliability.—You will depend on the electric vehicle for it is worthy of your confidence. It will not fail you.

Distinction.—The character of the electric vehicle is an expression of good taste.

Usage.—The electric passenger vehicle is primarily a business car as used by doctors, salesmen, merchants, etc., but its ease of control, freedom from dirt and noise, smooth, easy riding qualities and reliability, have made it a great favorite with milady for shopping, visiting and touring.

Resumé.—The principles of electric vehicle design are founded on those developed in the electric railway, and their reliability and simplicity are on a part with the street, elevated and subway cars on which we so greatly depend.

The last page is arranged for an attractive imprint of the concern circularizing the pamphlets.

CO-OPERATIVE PRICES.

Prices of pamphlets as above indicated and folded are as follows:

Quantity	Price per Thousand
1,000	$10.00
2,500	9.50
5,000	9.00
7,500	8.50
10,000	7.50
25,000	6.50
50,000	5.50
100,000	4.50

Prices of pamphlets printed in *one color* (black ink) on less expensive paper, *not folded*, are as follows:

Quantity	Thousand Price per
1,000	$7.00
2,500	6.00
5,000	5.00
7,500	4.00
10,000	3.50
25,000	3.00
50,000	2.50
100,000	2.00

To date, we have received the following orders:

5,000—United Electric Light & Power Co.

35,000—Philadelphia Electric Co.

1,000—Public Service Electric Co.

1,000—Buffalo Electric Vehicle Co.
10,000—Toronto Electric Light & Power Co.
1,000—Indianapolis Light & Heat Co.

Likely orders pending are the Utah Light & Railway Company, the Woods Motor Vehicle Co., the Waverley Company, and other concerns are considering this pamphlets for further distribution. The *Commercial Electric Vehicle Pamphlet,* a companion piece of literature, which will be sold for about the same money, is in course of preparation.

REGISTRATION OF VEHICLES.

A letter has been sent to each secretary of state throughout the country, asking him to indicate on the motor vehicle registration of the state the following information:

G. P. (gasoline passenger); E. C. (electric commercial); G. C. (gasoline commercial); E. P. (electric passenger).

We have received answers from most all of the secretaries of states, and there seems to be a disposition to utilize such scheme, which will be of considerable help to the association in ascertaining definitely the number of commercial and passenger electric vehicles actually registered. There seems to be considerable variance in opinion in this matter.

MOVING OF OFFICE.

The general office has been moved from the temporary quarters (used from February 1 to August 15) on the first floor of the United Engineering Societies' building, 29 West Thirty-ninth street, to the seventh floor of the same building, where two rooms formerly occuppied by the National Electric Light Association have been secured.

The new offices are well located, permitting excellent arrangement, making for efficiency.

EXECUTIVE SECRETARY'S REPORT.

Membership Committee.—The activity toward increasing membership has not lagged during the past month, although the results are not equal to those of the preceding month, 38 applications for membership having been received.

	Active. C.	Active. S.	Active. Mfrs.	Associate.	Auxiliary.	Press.	Total.
July Report	97	32	668	10	30	837
Resignations	0	1	3	0	0	4
Total	97	31	665	10	30	833
Transfers	1	0	1	0	0	0
Total	98	31	664	10	30	833
Applications pending	3	0	35	0	0	38
Total	101	31	699	10	30	871
Total Members	132		699	10	30	871

NEW ENGLAND SECTION.

	Active.	Associate.	Auxiliary.	Press.	Total.
July Report	32	76	1	1	110
Transfers	1	1	0	0	...
Total	33	75	1	1	110
Applications pending	1	1	0	0	2
Total	34	76	1	1	112
Total Members	34	76	1	1	112

CHICAGO SECTION.

July Report	12	101	1	6	120
Resignations	0	1	0	0	1
Total	12	100	1	6	119
Transfers	0	1	0	0	1
Total	12	99	1	6	118
Applications pending	0	1	0	0	1
Total	12	100	1	6	119
Total Members	12	100	1	6	119

PHILADELPHIA SECTION.

July Report	4	54	1	1	60
Transfers	0	1	0	0	1
Total	4	53	1	1	59
Applications pending	0	1	0	0	1
Total	4	54	1	1	60
Total Members	4	54	1	1	60

WASHINGTON SECTION.

July Report	1	37	0	0	38
Applications pending	0	0	0	0	0
Total	1	37	0	0	38
Total Members	1	37	0	0	38

SAN FRANCISCO SECTION.

July Report	0	17	0	1	18
Transfers	0	2	0	0	2
Total	0	19	0	1	20
Applications pending	0	0	0	0	0
Total	0	19	0	1	20
Total Members	0	19	0	1	20
July Report	2	38	0	0	40
Applications pending	0	1	0	0	1
Total	2	39	0	0	41
Total Members	2	39	0	0	41

PITTSBURGH SECTION.

July Report	2	25	0	1	28
Transfers	0	1	0	0	1
Total	2	26	0	1	29
Applications pending	0	0	0	0	0
Total	2	26	0	1	29
Total Members	2	26	0	1	29

NEW YORK SECTION.

July Report	17	173	3	18	211
Transfers	0	1	0	0	1
Total	17	172	3	18	210
Resignations	0	1	0	0	1
Total	17	171	3	18	209
Applications pending	0	0	0	0	0
Total	17	171	3	18	209
Total Members	17	171	3	18	209

DETROIT SECTION.

July Report	5	29	0	0	34
Applications pending	0	4	0	0	4
Total	5	33	0	0	38
Total Members	5	33	0	0	38

CLEVELAND SECTION.

July Report	3	12	0	0	15
Applications pending	0	0	0	0	0
Total	3	12	0	0	15
Total Members	3	12	0	0	15

TORONTO SECTION.

July Report	3	11	0	1	15
Applications pending	0	1	0	0	1
Total	3	11	0	1	16
Total Members	3	11	0	1	16

DENVER SECTION.

July Report	1	6	0	0	7
Applications pending	0	11	0	0	11

Total	1	17	0	0	18
Total Members	1	17	0	0	18
ST. LOUIS SECTION.					
July Report	2	7	0	0	9
Applications pending..	0	8	0	0	8
Total	2	15	0	0	17
Total Members	2	15	0	0	17

We take pleasure in submitting the petitions for a Denver and St. Louis section, the former afforded by E. M. Jackson of the Denver Gas & Electric Company, the latter by H. S. Marshall of the Electric Storage Battery Company of St. Louis.

Recently Mr. Becker received the return of the "round robin" letter from Mr. Jackson with the petition for a new section attached. It might be interesting to repeat that the purpose of the "round robin" letter was to give each one of the members of the committee the opportunity to tell the rest of the committee about the conditions and prospects of "doubling the membership" in his locality. The itinerary of this letter embraced practically the entire United States and also has a contribution from Toronto, Canada. Although one or two or the contributions were not the most encouraging, the document as a whole is enthusiastic and promises hearty support for the movement. When the letter was mailed on March 12, the membership stood at 602, while today, just a few days after its receipt, it is 871.

The 38 applications for membership were approved and accepted.

The petitions for the Denver and St. Louis sections were approved and accepted.

An expression of appreciation for the activities of the membership committee was extended by the boards.

SECTIONS GENERAL.

Generally speaking, there has not been a great deal of organized work conducted in the sections during the summer months, which accounts for the lack of reports on section activities in this review. However, there has been considerable work on the part of individuals in connection with sectional activities preparatory to the opening of the fall season, and it is expected that the next review by the executive secretary will contain extensive references to the very important work undertaken and completed by our fourteen sections, which, be it noted, is an increase of twelve sections since last October.

G. V. Truck Displaces Six Horses

The 5-ton G. V. truck used by the Wisconsin Milling Company of Menomonie, Wis., is a fine example of electric truck adaptability. It shows that the electric, instead of having limitations, at least in its field, is more elastic than any other truck.

Here is a truck which pays on a round trip of 1,700 feet, and with a daily mileage so small that the battery is charged but twice each week. Yet the truck displaces six horses and three men.

The truck carries flour. It is loaded practically inside the mill proper, which is interesting from the standpoint of insurance. With its load of flour it crosses the bridge over the river to the freight house and discharges the flour. Then it goes to the elevator nearby, the side doors are closed and the truck is loaded with grain by gravity feed. It then crosses the bridge once more and is back onto an odd dump. This unique unloading device was worked out by E. O. Wright, president of the Wisconsin Milling Company and G. V. engineers. The truck is elevated sufficiently to discharge the grain at a rapid rate. From the time the truck is backed on the dump till the truck is emptied and ready to be taken back into the mill warehouse for loading flour, does not exceed three minutes.

Another thing which lends interest in this unique illustration is the fact that Menomonie has about 6,000 people, and from the standpoint of paved streets, garaging facilities, etc., is the last place you would look for a 5-ton G. V. truck. At first there was a little tire trouble, due to the lack of a substantial road in wet weather, but the truck is now doing splendid work and is a credit to manufacturer as well as owner.

Efficient trucking is a matter of education and experience. It won't be long now before the older electric truck manufacturers will be able to devote more time to the merchant or manufacturer who has a truck problem which cannot be solved—in his estimation.

G. M. C. Sales Increase

There is no limit to the motor truck field. The surface has just been scratched. The commercial car industry, both gas and electric, is in better condition right now than it has ever been.

These are just a few of the observations of Z. C. Elkins, manager of the Chicago office of the General Motors Truck Company, on the future of the motor truck.

Mr. Elkins believes other builders of motor trucks will within a year follow the lead of the General Motors Truck Company in several of their new policies. For instance, the G. M. C. has quit trading in second-hand machines. They do not sell trucks on time and have quit making elaborate promises regarding free service. All promises of this character are now written in the order. In fact, everything that could be done has been done to put the commercial vehicle on the same high plane that the pleasure car enjoys.

"Sales for the last half of our fiscal year, ending July 31, 1914, exceeded the same period in 1913 by 44 per cent.

"Sales for the entire fiscal year ending July 31, 1914, exceeded the preceding year 33 per cent.

"Sales for July, 1914, exceeded July, 1913, by 137 per cent.

"Sales for July, 191', exceeded June, 1914 (the record-breaker), 8 per cent.

"The term sales as used above does not mean orders received, but actual, bona fide deliveries of new, up-to-date chasses—no second-hand, used or obsolete models are included.

"The number of dealers handling G. M. C. trucks is 232 per cent greater than on January 4, 1914."

Electric Car a Liberator

For the residents of the cities and the suburbs the electric car is a great liberator. It has freed people from the bondage of suburban and city street cars and raised them from despised commuters to envied motorists, without the trials and tribulations of the gas car owner. In this role of liberator the electric has proved itself more than efficient. By many it is regarded as the superior of the gas car and it is a proven fact that it is more economical by far than any other method of high-class motor transportation.

Exide Battery Depot and Garage, New York City.

A Model Commercial Electric Garage

New Exide Charging Depot Established to Care for the Increase of Electric Vehicles in New York City

A STEADY increase in the use of electric vehicles in New York City has necessitated increased facilities in central west side territory with a result that the Exide Battery Depots, Inc., 527-41 W. 23rd street, has been opened, complete and modern in every detail. This is probably the largest public electric truck garage not only in greater New York but in the entire United States, having a capacity for one hundred commercial electric trucks. The garage is located on the north side of 23rd street, having a frontage on the street of two hundred feet with a depth of plot upon which it is erected of one hundred feet. Built of brick, it extends for a distance of one hundred and sixty-five feet along 23rd street, the building being one story in height with the exception of the offices, which are two stories in height. The garage proper is located in the one-story portion of the building, which is entered by vehicles from the street through three large doors of sufficient size to admit the largest electric truck. The interior of the building is so laid out that every operation necessary in the efficient garaging of commercial trucks can be carried out successfully.

Besides the regular executive department, the garage is divided into three separate departments with an expert at the head of each. Most important of these departments is that of battery charging. The head of this department sees that all trucks are charged properly and all minor repairs to the trucks, such as relining of wheels, bushings, bearings, renewal of small parts and washing of trucks are made when needed. Battery repairing composes the second of the three departments. All necessary battery repairs are made in this department, including renewal of plates and subsequent testing of rejuvenated cells. The third of the departments consists of the stock room where all goods which either enter or leave the building are recorded. This department is of utmost importance in that it keeps a record of all material used and all material on hand. Located at the front of the building between two of the main entrance doors is the office of the superintendent of the garage. This office is situated above the oil room and is reached from the floor to the garage by the means of a single flight of stairs. The office is built entirely of glass, so that the superintendent when standing in it can see at a single glance all operations in progress on the garage floor.

General Office.

Directly beneath the superintendent's office, the oil room, a separate fireproof room, is entered from the garage floor through a single metal covered door. The switch panel room from which all current used in recharging the batteries is controlled, is located upon the garage floor. This room is equipped with ten switch panels arranged in two rows of five each, each panel has eight separate parts, two double-throw switches, one to carry a current of one hundred and five volts, and the other one hundred and twenty volts fitted on each panel. The rheostats used are of the Allen-

Bradley type, these rheostats having one thousand five hundred watts capacity. The importance of this type is the use of a series of carbon discs, the amount of current resistance being amply regulated between the maximum and minimum by the simple operation of turning a handle mounted on a shaft which varies the compression between the discs.

Each circuit from the boards to the garage room is wired for a current of a hundred amperes. There are a total of eighty charging circuits in this garage, each carried from the panel room to the garage room in suitable conduits connected with the underside of the roof trusses and then running down the steel roof columns to points approximately three feet above the floor level which connections contain sockets. The garage room is supported by twenty columns, each column carrying from three to five charging receptacles. A number of extension lines about twenty feet long are provided to charge the battery of trucks which are not placed directly beside the column.

Battery Charging Room.

Directly opposite the superintendent's office the shipping and receiving room is located, this room being provided with a large number of shelves and bins of various sizes, each for the storage of one particular piece of stock. Above the shipping department a room is kept solely for the use and convenience of drivers and helpers of trucks which are garaged in the station. In this room there are one hundred and twenty-five steel lockers, each driver and helper entitled to the use of one. The room is well equipped with chairs and small tables for their convenience.

The battery repair room is located on the street level and runs the entire depth of the building, about a hundred feet, and has a frontage on the street of thirty-five feet. In the center of one of the long sides of the room, four large panels for the testing of battery cells are located. Twelve wooden posts, each carrying several testing circuits, are suspended from the center of the roof of the room and extend to within six feet of the floor. The cells to be tested are arranged in parallel rows on either side of the posts; the current is carried from them by means of a short extension line. The United Electric Light and Power Company supplies all current used throughout the building.

Switchboard Panels.

Thirty-five men are employed in the garage, battery, repair, shipping and receiving departments; twenty-five being engaged in the battery repair department, the remaining ten in the garage and shipping department. The station is operated both day and night with two twelve-hour shifts of workmen.

The entire building is fireproof in every particular except the roof, this being constructed of wood. The floors of both the garage and battery repair rooms are constructed of concrete, graded so as to be self-drained. Very unique hand trucks are used in transferring the batteries from the garage floor to the battery repair room. An interesting feature of these trucks is the fact that the platform can be raised or lowered by a simple movement of the handle by which the truck is pulled. By this arrangement the truck can be pushed beneath the small stand upon which the battery to be moved is loaded, and then by a movement of the truck handle, the truck platform can be raised to a sufficient amount to elevate the battery entirely clear of the floor. The trucks consequently eliminate the operation of lifting the battery stand either on or off of the floor. The system employed in this garage has many salient features which are worth consideration. When a truck enters any one of the three main doors the doorman directs the driver to the position which the truck is to take. A complete inspection of the vehicle is made at once and any minor repairs are made if necessary. All repairs are billed to the owner of the truck and records preserved by the garage. Each sheet covers a twelve-hour period and the repairs are made and recorded for the garaging of the truck and also for the charging of its battery, based on a flat rate at so much per truck per month. The trucks which are not kept in the station may be boosted at a rapid rate by using the hundred and twenty volt current. A report is made out for every vehicle that is charged. Carbon copies of the reports of jobs done are sent daily to the manager's office, where a permanent record of each job is kept. The manager can then tell at a glance just what work has been done in the entire station, the dates and the amount of all materials used, the matter of charging each battery, the

battery repair work done and a detailed statement of all stock on hand.

This is one of the very few electric garages which employ an accurate record system. The truck owner

Interior of Garage.

can determine at any time just exactly what work has been done on his vehicle and the exact amount of time expended and the cost of each repair.

Electric Structure for New Departure Company

The New Departure Manufacturing Company, Bristol, Conn., will shortly occupy its large and handsome administration building, which has been in the course of erection for the past twelve months. The phenomenal growth of this company in the past few years has made it necessary to frequently provide large additions to its manufacturing facilities. The demand for New Departure ball bearings has increased so rapidly that the company could not wait to build necessary additions and consequently bought out the extensive plant of the Whitlock Coil Pipe Company at Hartford, comprising 145,000 square feet of floor space. It was not long before still further additions became imperative. Office quarters were also insufficient, and it was decided to provide adequate facilities by the erection of this building, which is 62 feet wide, 220 feet long, and six stories high, including the basement.

The building is modern in every detail of construction and absolutely fire proof. The office is located on the fifth floor, and is connected by an electric elevator of the latest type running from the lobby of the building to the lobby of the office. On this floor, in addition to the general office, a large foreman's conference room with a small kitchen attached, contains entire equipment for serving luncheons.

All office furnishings are mahogany and so arranged that the workers in each department are immediately opposite the private office of the head of that department.

The first floor will be given over entirely to shipping and receiving. The remainder of the building will be occupied principally in the inspecting and assembling of the company's product.

The company this year enters upon the first days of the second quarto-centenary of its existence. Nearly twenty-five years ago the New Departure Manufacturing Companay started business in a small room containing less than 60 square feet, and today it is occupying nearly that many square acres, with several millions of dollars invested in machinery operated by two thousand skilled mechanics, and busy day and night the greater part of the time. It is said to be one of the most thoroughly equipped manufacturing plants in America. One entire building is equipped with chemical, metallurgical and physical testing laboratories, outfitted with the most modern apparatus and is devoted exclusively to the scientific study and analysis of steel and manufacturing processes.

Beginning January first, changes were effected in the organization which will still further develop the plant to its many possibilities. Albert F. Rockwell, who was one of the founders of the company and whose genius has developed the patents covering the company's product, has been relieved of certain managerial details but his duties as president continue.

DeWitt Page, who has also been identified with the company almost from its inception and in later years as secretary, sales manager, purchasing agent, and advertising manager, has been appointed general manager. Mr. Page is well known to the trade and brings to his position unusual abilities and a knowledge of the company's affairs in production and promotion.

Charles T. Treadway, who for some years past has been treasurer of the company, continues in that capacity but also becomes chairman of the board of directors, and in that capacity becomes an important factor of the future development of this most successful New England manufacturing enterprise.

Electric Pleasure Car Growing Popular

An important phase of the automobile industry this year is that the electric pleasure car has come into its own as never before.

The great increase in the number of electrics in use this year over a year ago, for instance, is proof positive of this assertion. Nor is this spread in their usage confined to any particular city or section of the country.

In America's city districts with their enormous area and the necessity for long trips back and forth to the shopping districts, electrics are more in evidence than in any other city in the country. In hilly cities like Pittsburg, where it was once predicted the electric would never become practical, the streets are dotted with electric cars. In New York, where cars go at a brisk pace to keep up with the procession, the same thing is true.

In Detroit, which boasts of more electrics than Chicago in proportion to the population, more than 700 Detroit cars alone are in service.

Changes tending toward the greater practicability, dependability, and economy of electrics have been coming so fast that many are scarcely aware of them to the full extent of their importance.

Electrics used to be too slow, unable to climb sharp grades and likely to get stalled on snowy streets. Not only was it necessary to build more strength and greater speed into the car but also to increase the mileage on a charge. Today electrics can travel faster than the law allows and can go farther in a day on a single charge than even the most ardent driver cares to cover.

Along with this advancement in mechanical features has come a development in looks and safety, until today it may be said to have reached a point in the perfection of bodies and upholstery that the most imaginative coach builder of five years ago never dreamed of. It is conceded that the bodies of electrics today are more luxurious than the bodies of other types of cars.

Buffalo Electric Demonstrates 1915 Model

Manufacturer Tests New Passenger Electric of Unusual Design

AUTOMOBILE experts, electrical engineers, capitalists, newspaper representatives and officers of the Buffalo Electric Vehicle Company were guests at a demonstration of the company's new 1915 model, the test being held Friday, August 21.

The model used in the exhibition was a five-passenger brougham having a somewhat unusual construction, especially in the general arrangement of its control and interior seating.

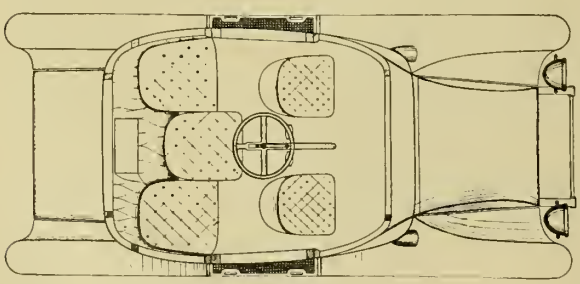
The company's policy and sole endeavor has always been to produce a passenger vehicle which would not only cover its field as a reliable city car, but also as a vehicle capable of making cross country runs of reasonable distances. The company's engineers have also attempted to simplify the present methods of operation and control.

In the new 1915 model the old style control has been entirely eliminated. A most radical change exists in the steering post, which is located in the center of the car.

This gives the driver a clear and unobstructed view from every angle. Located on the steering wheel the control lever is similar in appearance and operation to the gas throttle on a gasoline car. This lever is connected with an exclusively designed controller enclosed in a dust, water and oil proof housing in the base of the steering helm.

There are no fixed speed positions on this control, the circuit remaining unbroken from the lowest to the highest point, thus making arcing and sparking positively impossible arising from careless or improper manipulation.

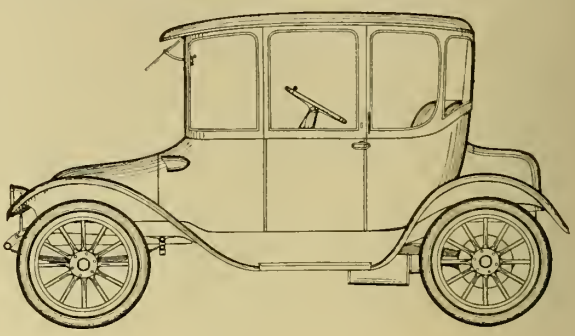
The car has a speed from nine to twenty miles, the greatest efficiency in regards to mileage and being obtained in speeds ranging from eleven to fifteen miles per hour and as follows: at eleven miles per hour seventy-seven miles for battery charge, twelve miles per hour seventy-six miles for battery charge. Thirteen miles per hour seventy-five miles for battery charge. At fourteen miles per hour seventy-three miles for battery charge. At fifteen miles per hour seventy-one miles for battery charge. These figures represent averages taken



New Ideas in Seating Arrangement.

from various tests made with the car equipped with standard battery, carrying a capacity load and working out in current consumption approximately sixty-five watts per ton miles.

The vehicle is capable of negotiating a fifteen per cent grade at a speed of seven and five-tenths miles per hour at one hundred and eight amperes. During a recent demonstration the vehicle covered twenty-six miles on a current consumption of fifty ampere hours, the car



Side View of Buffalo Electric.

weighing four thousand pounds and carrying five passengers.

This model is equipped with a special motor designed by F. G. Peck, the company's engineer. With this motor by means of external resistance in the field circuit, the field current can be varied independently of the armature current.

A decrease of field current causes the armature speed to increase, and an increase of field current causes a decrease of armature speed. As the average field current is small in comparison with the average armature current the field resistance loss is small, and as the field resistance may be provided with a large number of steps, this method offers an efficient and flexible speed control without changing the applied voltage. Eighteen steps are provided in the field resistance in this new Buffalo Electric control, giving as many changes of speed, ranging from 9 to 20 miles per hour.

A foot pedal is used for starting and stopping, which, when thrown forward, cuts off the current and applies the brake. Releasing this pedal causes the following operations to take place in the order named: The brake is released, a switch is closed connecting the motor to the battery through a starting resistance, the starting resistance is cut out step by step until when the pedal is entirely released the battery leads are connected direct with the motor. At this point a speed of nine miles per hour has been attained and the higher speeds are taken care of through the speed lever located on top of the steering wheel.

It is seldom necessary to use the mechanical brake, except for starting and stopping, as advantage is taken of the electric braking efficiency of the motor. When the car is being propelled at a given speed the motor, due to its speed, has a certain voltage, or counter-electromotive force slightly lower than the battery voltage. When starting on a down grade the motor speed increases until its voltage exceeds the battery voltage and a charging current is thereupon forced through the battery. This increases until the motor, now running as a generator, has a counter torque opposing and equal

to that supplied by the momentum of the car which will continue down the grade at no appreciable increase in speed, acceleration being prevented by the electric brake action.

As another example of the electric braking efficiency of the motor, assume that the car is running along a level stretch of road at say fifteen miles per hour. Wishing to slow down upon approaching a crossing or congestion of traffic, it is only necessary for the driver to shift the control or speed lever to a lower speed position and the car immediately slows down to that speed, the excess of momentum being utilized in recharging the battery, until the speed of the car has dropped to the point for which the speed lever is set.

Cutting out field resistance decreases the speed at which the recharging takes place, and cutting in resistance increases the speed, and as these operations are effected by the control lever the speed may be decreased by moving the lever in one direction either when running up or down hill.

When the speed lever is set in a position to drive the car at a given speed on a level road, this same speed is maintained either up or down hill without changing the position of the speed lever.

To obtain reverse motion a small knob located on top of the steering post is raised which reverses the field, and reverse speed is then regulated by a small control lever which regulates forward speeds.

The mechanical construction of the car is interesting. The frame is made of pressed steel channel section, reinforced at angles. The front spring is semi-elliptic, 39 inches by 2 inches, seven leaves. The rear spring is 48 inches by 2.5 inches—nine leaf contilever construction. The wheels are 34-inch selected second growth hickory, mounted on Timken roller bearings. The front axle is a Timken Detroit of drop-forged I-beam section. The rear axle is a Timken Detroit full floating, with hellicle bevel gear, noiseless and free-running. There are two sets of brakes—internal expanding and external contracting. In addition to this the motor brake is wound for 85 volts, 35 amperes, and is of special slow-speed construction with 400 per cent overload capacity. It is inclosed in a dust, oil and waterproof housing, integral with the rear axle, and is mounted on a three-point suspension with forward support of the ball and socket type to compensate for uneven road conditions and to relieve tortional strains.

The drive is direct from the motor shaft to rear axle, all working parts running in oil.

The standard battery equipment consists of 42 cells, 15 plate Philadelphia battery of 140 ampere-hours capacity.

The interior seating arrangement is quite unique in that it presents many original ideas. There are five individual seats—two revolving seats in front on either side of the steering wheel which permit occupants to face forward or back towards the driver. The rear seat is divided into three individual sections, the driver occupying the center section which is slightly forward from the other two seats. The general lines of the vehicle are excellent. The car presents a real advancement in electric vehicle construction.

Electrics in England

A. Jackson Marshall, of the Electric Vehicle Association of America, is just in receipt of further advices regarding the European situation as effecting electric vehicles, which is of interest. This correspondent, representing one of the largest concerns in England, writes to the American association in part as follows:

"I thank you for your favor of the 6th inst. Notwithstanding the war, and, in point of fact, the real cause of it, there is at the moment a great demand for vehicles. The government has commandeered for war purposes about 25 to 33 per cent of available, suitable horse flesh, as well as large numbers of petromobiles of the commercial and passenger types.

"Continental designs of vehicles are, as you can readily understand, absolutely barred, and therefore the present is the unique and psychological moment for American manufacturers to appoint agencies or to fix up branches in the leading cities of this country.

"As I have already mentioned, the widest field will be presented by the commercial and municipal vehicle, and makers of commercial vehicles should concentrate upon designing suitable bodies and machines for municipal services, such as refuse collection, street watering and flushing, street sweepers, and etc. It can be fully anticipated that the example of the municipalities will be very quickly followed by the leading commercial and industrial firms in the country.

"The war, therefore, can be looked upon as accelerating and not retarding the introduction of the Electric Vehicle in this country, and I hope the American manufacturers will take full advantage of the situation.

"I have to thank you for putting the vehicle makers and makers of electrical accessories on my track, as the information they have passed on to me is proving of the greatest assistance.

"You doubtless will be meeting Mr. Chattock who has been appointed by our electric vehicle committee to attend the convention in Philadelphia this year, and you will find him (and this applies to the great body of station engineers in this country) an ardent disciple of the electric vehicle."

Large numbers of electric vehicles have already been shipped to England and other European countries, thus helping to popularize the slogan "Made in America."

Walker Sales

The Walker Vehicle Company, after a series of tests, just completed, over the steep grades in Cincinnati, has proven, contrary to popular belief, that electric vehicles are not put to a disadvantage by the hills hereabouts.

These tests showed that the efficiency of the patented Walker balance drive differs only slightly between a zero and a 20 per cent grade, and between no load and full load. While the power used in climbing the steep hills was necessarily high, this was counteracted by the fact that no power was used coming down grade, so that the average current was practically the same as is used in a city like Chicago, where all streets are level.

Recent deliveries of Walker electrics to Cincinnati concerns are those to the Cincinnati Coffin Company (re-order), the E. Kahn Sons Company and the Union Gas and Electric Company, the last two replacing gasoline machines that have proven unsatisfactory for this kind of work.

Apropos, word comes from Chicago of an order just placed by Marshall Field & Co. for twenty-six additional Walker electrics, making a total of 192 Walker electric trucks in the delivery service of this great concern.

New Ohio Agency for Louisville

The Ohio Electric Agency of Louisville opened a sales room and service station at 662 Fourth street, on November 1, 1913.

The business based its future upon the sale of one line of cars, Ohio electric; careful individual attention to each car and owner; and a restricted overhead expense.

An advertising compaign and personal solicitation informed local electric owners of the location and purpose of the agency; and secured for the agency all service work for every Ohio electric locally owned together with work for a few other makes.

The old quarters have been outgrown and pursuing plans of enlargement, the Ohio Electric Agency has been incorporated as the Electric Garage Company of which George G. Bader, former owner of the agency is president.

The Electric Garage Company is erecting its garage at 1817 Third street. The building is modern and fire-proof and will be equipped for the exclusive use of electric pleasure cars.

The following conditions determined the selection of the site,—it is located on a well paved main traveled street, convenient for those already owning cars, accessible with spacious entrance and exit nearly on a level with the street, and the immediate vicinity affording prospects of future business.

The following ideas shaped the plans of the building,—it does not detract from the appearance of the neighboring structures, it combines beauty with durability, insures perfect light and ventilation, affords unhampered use of all garage space, and is capable of enlargement.

The following requirements were considered essential for the equipment,—the charging plant combines flexibility with highest possible efficiency, makes possible the completion of a full charge in a shorter space of time than has been the custom, and results in the increased life for batteries charged.

The other equipment was purchased as the above with quality the determining factor.

The building is of red brick, with a front of red glazed brick and marble surmounted with a pagoda of red tile. The walls and foundation are of sufficient strength to support extra floors. The roof is of four inch concrete supported by steel girders eliminating the use of posts. Around the interior of the garage floor there is a base guard to prevent contact of machines with the walls.

The lighting system for the show room and for the office is indirect, while the garage is equipped with large sky lights and numerous large electric lights in beehive reflectors. These are controlled with enough switches to prevent the waste of current. Around the side walls there are sockets for the attachment of drop cords. These will afford light for the pit as well as light for sides of cars and power for a portable air tank.

It has been planned to allot each car a given space and always keep that space for the exclusive use of that car, which should avoid confusion and make for greater attention to each machine.

A complete system of records has been worked out so as to secure for the company as well as the owner an accurate chart of the service and cost of each machine.

The sale of the Ohio electric will be continued, and some 1915 models will be shown at the formal opening of the new place of business October 1.

These 1915 Ohio electrics will embody the latest approved ideas of design, including hand hammered aluminum crown fenders, brake guards, helical and worm gears, sashless glass operated by a new window lifting device, and exclusive features such as the magnetic control, magnetic brake and the ball and socket motor suspension.

Life of Storage Battery

The electric vehicle is now conceded to be one of the most dependable methods of transportation, and credit is due in no small measure to the reliability of the storage battery, which, during the past fourteen years, has been improved to such an extent as to give service, in both life and mileage, beyond the fondest hopes of pioneer manufacturers.

There are two distinct classes of vehicles, viz: the pleasure or passenger car, and the commercial car or truck, but batteries of the same construction are used in both classes. For the commercial car, however, the batteries contain a greater number of cells and more plates in each cell.

Other things being equal, the life of a storage battery plate is governed by the number of charges and discharges and the elapsed time over which they are taken; the care the battery receives is also an important factor; and the service conditions affect the life as well.

In pleasure or passenger vehicle service, the average life of the flat or pasted plate varies from 18 to 24 months, and in many cases much greater life is obtained, plates giving up to thirty-six months life.

In commercial vehicle service, where the conditions are more severe, the life averages from 14 to 18 months, although, under very favorable operating conditions and good care, longer life is obtained.

The total mileage obtained from a set of plates is, of course, governed: First, by the number of discharges, and next by the mileage made on each discharge. If a battery is charged each day, the total mileage will be much greater if the daily requirements necessitate long mileage.

For example, it is estimated that the average daily mileage of all pleasure vehicles is approximately twenty to 25 mile, while in many cases cars are run from fifty to seventy miles a day. Assume one car runs 40 miles each day and a set of plates lasts 14 months of 30 days each or 420 days. This would give 420 times 40 or 16,800 miles.

Another car runs 20 miles each day and a set of plates lasts 24 months of 30 days each or 720 days. This would give 720 times 20 or 14,400 miles.

One of the most recent developments in the storage battery field is the "Ironclad-Exide" battery, which was placed on the market early in 1911 after The Electric Storage Battery Company had spent four years in perfecting it. Batteries of this type have been in pleasure and commercial vehicle service since March 1911, and they have made in five ton trucks from 25,000 to 30,000 miles.

It is the practice of the manufacturers of the "Ironclad-Exide" battery to guarantee the plates of this type to give 20,000 miles within a period of three years, in pleasure vehicle service; and for a period of two years, regardless of the mileage or number of charges, in commercial vehicle service.

THE Detroit ELECTRIC

Buy an Automobile as you would a Bond— Study the Security back of it.

$1000 Price Guarantee on 1915 Detroit Electrics

As a guarantee of good faith on our part, and as an *extra protection* to DETROIT ELECTRIC owners, we hereby agree to pay anyone $1000 who can purchase or cause to be purchased a new 1915 DETROIT ELECTRIC from us in the City of Chicago during 1915 Season at less than our regular established prices.

We have reached a volume of business large enough (selling more than two to one over our largest competitor) to permit the giving of maximum quality and at the same time a reduction in price.

In determining the selling price of an automobile, the manufacturer first arrives at his cost, and ***that cast is absalutely determined by quality, valume and facilities for manufacturing.*** When this cost has been determined, the selling price is then determined by adding to the cost such profit as must be realized.

The original selling price of any automobile that is selling at a discount or a cut price must of necessity have been *purposely* fixed. While the seller of such automobile may infer that the discount or cut in price is strictly confidential and personal to you, such representation is not based on facts, for the reason that if *you* can buy that particular automobile at a discount, every other intelligent purchaser can buy it at a discount —and the question must come to your mind: "Am I getting the greatest discount?" "How do I know that I have gotten the lowest price or best discount?" And then you will naturally ask yourself the question: "If a certain concern has an 'individual' discount policy in the selling of an automobile, are they not apt to have a discount policy in the manufacturing of that same automobile?"

In determining *our established selling prices*, nothing was added to our cost *to be taken off again* in the way of an "individual" discount or cut in price. This reduction or "individual" discount was *actually* made before the prices were established. Hence our guarantee of $1000 to substantiate this fact.

Think what this means to you as a purchaser, to own an automobile of recognized *known value*. Why, the resale price of every used DETROIT ELECTRIC is increased at least 30% over any make of Electric that is selling at a discount or cut price.

How does a purchaser save anything by buying a discount car at even 20% off, when a DETROIT ELECTRIC used car brings at least 30% more cash value on the market?

The general public knows that the driver of a DETROIT ELECTRIC owns the best the world offers and that the *price* paid was just as *standard* as the car. That is why a DETROIT ELECTRIC brings a higher price for resale.

All will admit that if an automobile at list price represents 100 cents on the dollar, it cannot be sold for less, without a loss to the seller. It then follows that any automobile that sells for less than list price does not have an *honest list price*, therefore, what is the price? And how do you know what is the *lowest price?*

DETROIT ELECTRIC established prices are not inflated, consequently our $1000 price guarantee.

Anderson Electric Car Company

(Manufacturers Detroit Electrics)

Largest Exclusive Electric Vehicle Manufacturers in the World

Direct Factory Branch: 2416 Michigan Avenue, Chicago, Illinois

ELECTRIC VEHICLES

Vol. 5 CHICAGO, OCTOBER, 1914 No. 4

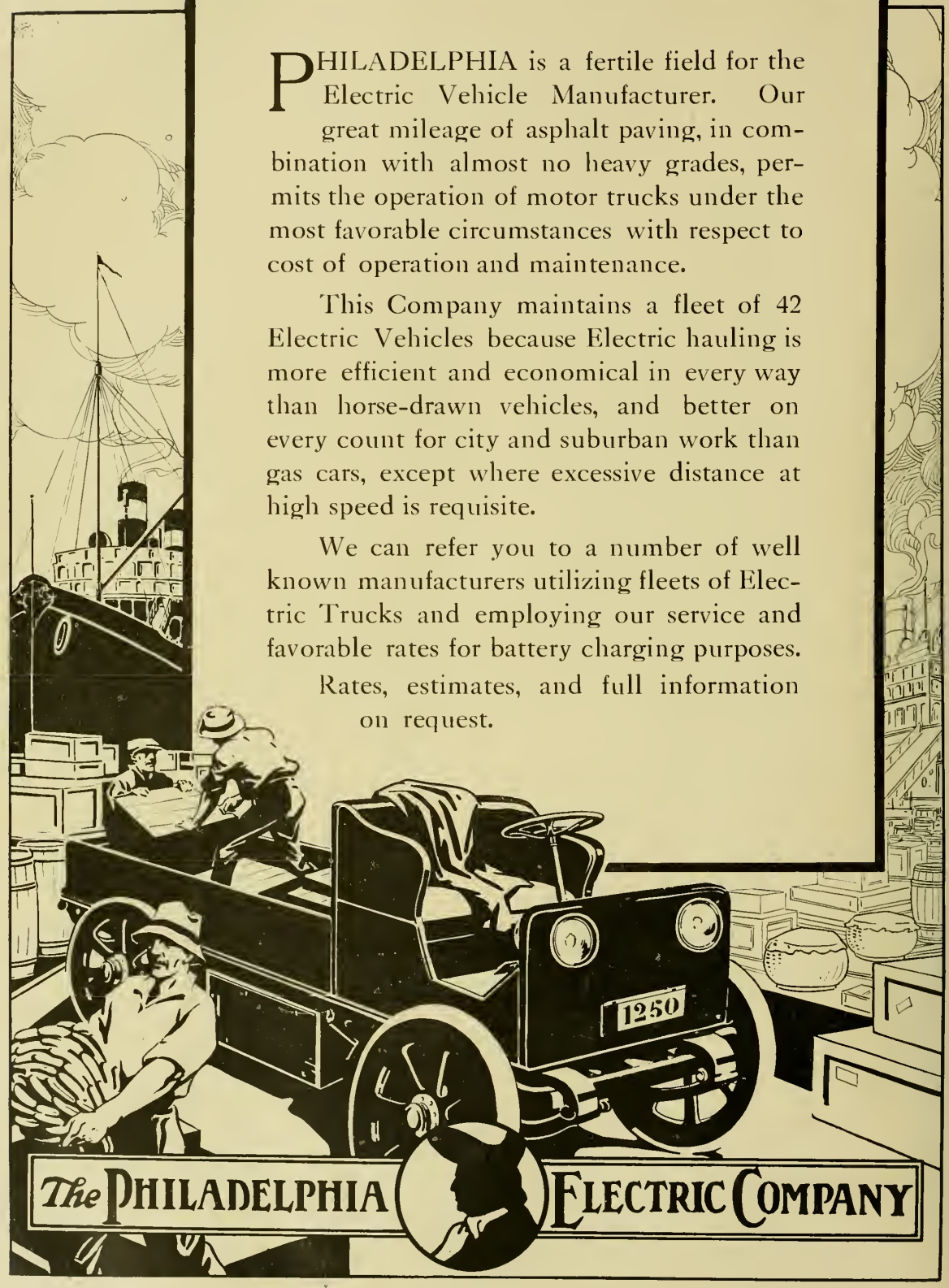
WOODS FOUR PASSENGER BROUGHAM 1915 MODEL

PHILADELPHIA is a fertile field for the Electric Vehicle Manufacturer. Our great mileage of asphalt paving, in combination with almost no heavy grades, permits the operation of motor trucks under the most favorable circumstances with respect to cost of operation and maintenance.

This Company maintains a fleet of 42 Electric Vehicles because Electric hauling is more efficient and economical in every way than horse-drawn vehicles, and better on every count for city and suburban work than gas cars, except where excessive distance at high speed is requisite.

We can refer you to a number of well known manufacturers utilizing fleets of Electric Trucks and employing our service and favorable rates for battery charging purposes.

Rates, estimates, and full information on request.



Published Monthly By
ELECTRICITY MAGAZINE CORPORATION
Monadnock Building
CHICAGO

Entered at Chicago Post Office as Second Class Mail Matter

ELECTRIC VEHICLES

WITH WHICH IS INCORPORATED IGNITION

TRADE MARK REGISTERED IN THE UNITED STATES PATENT OFFICE

SUBSCRIPTION PRICE
Domestic - $1.50
Canada - - $1.75
Foreign - - $2.00

FOR SALE AT ALL NEWS STANDS

If Your News Dealer Will Not Supply You—Please Notify Us

Volume V | CHICAGO, OCTOBER, 1914 | Number 4

Plans Completed for E. V. A. Convention

Convention Committees Report Active Interest

By A. Jackson Marshall

THE finishing touches are being applied to the very extensive program of the fifth annual convention of the Electric Vehicle Association of America, which will be held Monday, Tuesday and Wednesday, October 19, 20 and 21, at the Hotel Bellevue-Stratford, Philadelphia.

During the past year twelve sections have been added to the two existing at the time of the fourth annual convention held last year in Chicago, bringing the sectional representation up to fourteen, so that the reports of the various sections — distributed all over the country—will prove of unusual interest. Doubtless plans will be formulated at the convention which will enable the sections to make even greater advance during the coming year, and the reports and discussions of section activities should be one of the bright spots of this event.

The reports of the especially active committees will reflect great progress, communicating many important developments that are of considerable benefit to the industry generally. Undoubtedly inspirations will be obtained at the convention for committee activities during the coming year, and all those having subjects to suggest which might form the basis of committee activities, are urged to be present and offer such suggestions for future consideration.

Hotel Bellevue-Stratford, Convention Headquarters.

The papers are of extremely wide range and completeness. They will make the broadest kind of appeal, and there is something of especial interest to each.

Central stations especially will find the convention of great assistance. A number of very important papers based on the actual operation of electric vehicles by central stations will be presented. A great amount of operating data of a most minute and complete character will be released. All central station interests should be represented at this convention. A cordial invitation is extended by the association for the attendance of all interested, whether members of the association or not.

The tentative business program as developed to date, follows:

MORNING SESSION — OCTOBER 19.

10:00 A. M. Mayor Blankenburg's address, 30 minutes.

10:30 A. M. President's address, 45 minutes.

11:15 A. M. Executive secretary's and treasurer's reports, 30 minutes.

11:45 A. M. Reports of sections, 30 minutes.

12:15 A. M. Report of constitution and by-laws committee, 10 minutes.

12:30 A. M. Appointment of nominating committee.

AFTERNOON SESSION—OCTOBER 19.

2:00 P. M. Report of committee on membership and formation of sections, 15 minutes.

2:15 P. M. Report of insurance committee, 5 minutes.

2:20 P. M. Report of papers committee, 5 minutes.

2:25 P. M. Report of committee on operating records, 5 minutes. (Especially interesting report.)

2:30 P. M. Report of committee on legislation, 5 minutes.

2:35 P. M. Report of garage and rates committee, 10 minutes.

2:45 P. M. Report of committee on educational courses, 10 minutes.

2:55 P. M. Report of standardization committee, 10 minutes.

3:05 P. M. Report of traffic committee, 10 minutes.

3:15 P. M. Report of traffic committee, 10 minutes.

3:20 P. M. Report of committee on central station co-operation, 10 minutes.

3:30 P. M. Report of committee on parcel post delivery, 10 minutes.

3:40 P. M. "Progress of the Electric Vehicle," by James H. McGraw, 40 minutes.

4:20 P. M. "Electric Vehicles in Parcel Post Service," by William P. Kennedy, 45 minutes.

EVENING SESSION—OCTOBER 19.

8:00 P. M. "Electric Vehicle Charging," by J. F. Lincoln, 30 minutes.

8:30 P. M. "Special Applications of Electric Trucks," by F. Nelson Carle, 60 minutes.

9:30 P. M. Report of the moving picture film committee, 5 minutes.

9:35 P. M. Moving picture.

MORNING SESSION—OCTOBER 20.

10:00 A. M. "Electric Vehicle Performance," by Robert B. Grove, 45 minutes.

10:45 A. M. "Effects from the Utilization of the Kinetic Energy of an Electric Vehicle," by T. H. Schoepf, 45 minutes.

11:30 A. M. "A Wider Dissemination of Electric Vehicle Information," by T. I. Jones (a lecture), 30 minutes.

AFTERNOON SESSION—OCTOBER 20.

2:00 P. M. "Calculations of Electric Motor Characteristics and Prediction of Vehicle Performance," by A. A. Nims, 60 minutes.

3:00 P. M. "Educating the Public in the Field and Use of the Electric Vehicle," by F. C. Henderschott, 45 minutes.

3:45 P. M. "Power Wagon Operation in Central Station Service," by W. A. Manwaring, 30 minutes.

4:15 P. M. "Electric Fire Apparatus," by Chief George S. Walker (a lecture), 45 minutes.

MORNING SESSION—OCTOBER 21.

10:00 A. M. "The Design and Performance of Electric Vehicle Motors," by H. S. Baldwin, 45 minutes.

10:45 A. M. Symposium—"The Electrical Industrial Truck," by manufacturers, 60 minutes.

11:45 A. M. "The Cost of Electric Vehicle," by George H. Kelly, 45 minutes.

12:30 A. M. Report of nominating committee and election of officers.

AFTERNOON SESSION—OCTOBER 21.

2:00 P. M. "European Development of the Electric Vehicle Industry," by P. D. Wagoner, 30 minutes.

2:30 P. M. "Constant Potential Systems for Charging from Motor Generators," by H. P. Dodge, 30 minutes.

3:00 P. M. "The Motor Truck in Traffic Congestion," by Lieut. William D. Mills (a lecture), 30 minutes.

3:30 P. M. No. 30 (Louis E. Burr); No. 31 (H. H. Doering), 60 minutes.

It is particularly fortunate that such an amount of carefully prepared operating data will be presented. A great wealth of this important and heretofore evasive information will be presented in satisfying abundance on all important subjects.

ELECTRIC VEHICLES will be represented at this important convention.

Official proceedings will be reported, papers read and lectures presented will be reviewed in the November number and published in full in near future issues.

Berlin Adopts Electrics

The following notes were sent to us before the outbreak of war by our correspondent in Berlin, says *Electrical Times* of London:

Berlin, like other large cities, is ever being worried with its traffic problem, and the means of locomotion are constantly being supplemented. The latest changes remind one of the events which took place in London a few years ago, when the Electrobus Company started its services of accumulator buses. In the case of Berlin, however, there is this difference: that with the coming advent of the electric bus service the accumulator has been improved to such an extent that it is now a commercial proposition, while, on the other hand, a most important event has taken place considerably endangering the success of gas bus services. At the present time gas bus services are run to several parts of the city, covering both the business and residential quarters, and these services are in the hands of the Berliner Allgemeine Omnibus Gesellschaft. The buses are built by the Daimler Company, and are of its newest type. While the new buses do not traverse the best residential districts, no complaints so far have been made against them, but some of the old lines belonging to the B. A. O. G., which have for some considerable time been serving both the poorer and better class neighborhoods, have been the subject of very forcible complaints among the residents of the better class districts.

The burnt gas fumes seem to be the chief cause of complaint, and the residents have now been successful in persuading the police to issue regulations preventing the buses running through the districts involved, with the result that the services of these buses have been considerably curtailed.

The maufacturers of the accumulator-driven heavy class of vehicle, as a result of their success, have been making preparations for a bus onslaught in Berlin, and this action of the police has been, as far as they are concerned, particularly opportune. The police, no doubt influenced to a great extent by the complaints against the gas buses, have granted considerable concessions to the new accumulator buses, so that Berlin will shortly be honeycombed with routes served by this type of vehicle. The promoters, in order to make doubly sure of success, are taking advantage of the asphalt paved streets, and as far as possible the routes will be chosen so that any asphalted streets will be served. Owing to the preponderance of this class of paving, these buses will be certain of a good traffic, and of probably the best class of traffic.

The new services are being hailed by electric interests as the fulfillment of a long-felt want, and it is to be hoped that the success of these buses will eliminate the present atrocious gas fume sprayers.

The new buses will be in competition with the electric railways, the railroads, and some of the existing gas bus services.

The Motor Truck Club of America, New York division, held its third annual outing and ladies' day at the Marine and Field Club, Gravesend Bay, Brooklyn.

The day was given up to yachting, golf and tennis and an interesting baseball game took place between two picked teams, known as the Back Fires and the Self Starters, and it took six innings to prove that one team had nothing on the other.

English Designed Charging Plug and Socket

British Section, International Electro-Technical Commission Approves Standard Design

THE complete design of battery charging plug and socket which the English Electric Vehicle committee recommends as suitable for standardisation by the British section of the International Electro-technical Commission, has been prepared and is here described and illustrated.

A standard design for an electric sign, for use outside charging stations and garages where charging facilities are provided, has also been approved and will be published in a near future issue.

BATTERY CHARGING PLUG AND RECEPTACLE.

The accompanying illustration shows the design of plug and socket recommended for standardising by the Electric Vehicle Committee.

It will be seen that a concentric type has been adopted in spite of its disadvantages, the reason being, apparently, that this style of plug is used generally in America. The committee, while recommending that the charging circuit should be broken at a suitable quick-break switch, provided specially for the purpose, and forming part of the permanent equipment in the garage or charging station, does not prohibit the opening of the circuit at the plug in emergencies. There is nothing to prevent the driver or attendant from following this objectionable practice at any time, and the risk of arcing, and of consequent destruction of the plug or socket, or of both, is considerably greater with a concentric, than with a two-pin plug. The American influence on the committee is shown by the adoption of the Yankee term "receptacle" for its British and more descriptive equivalent "socket."

It is recommended that the standard socket should be fixed in such a position under the front of the driver's seat that he will, of necessity, be compelled to remove the plug before he can take his seat. It is also suggested that the charging cable be fitted with a standard plug at both ends, so that when not required the length can be coiled up and stored out of the way. A standard socket would be provided on the charging switchboard, fixed horizontally.

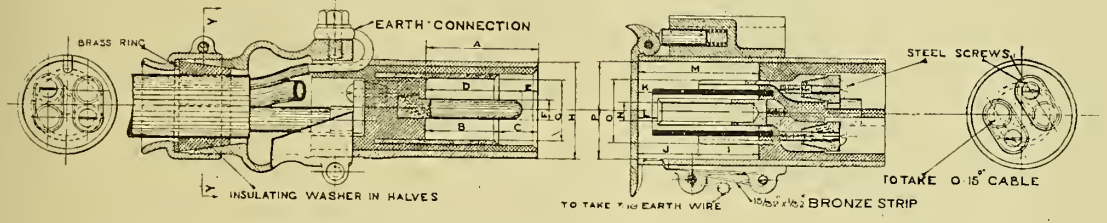
The plug and socket have been designed to carry safely 150 amperes continuously, but they may be used to carry boosting charges up to a maximum of 300 amperes for an hour or two. It is also noted that the committee has decided that the metal shell of the plug and that of the socket must be effectively earthed. It will be seen from the accompanying diagram that provision is made on the socket for an earthing contact finger, and that the fixed end of this finger is prolonged to form a socket terminal into which a 7/16 bare copper cable can be sweated, the other end of the earthing conductor being taken, in the case of the vehicle, to the metal work of the chassis and on the charging switchboard to a common earth terminal.

It is specified that the shell of both plug and socket should be formed from solid-drawn steel tube, and the bracket and cap for the socket of malleable iron. A spring-operated cap is to be provided for closing the opening when the plug is not in place.

The bracket to take the socket, the outer surfaces of the latter and those of the plug are to be turned bright, so that good electrical contact may be assured.

As to the type and size of cable to be employed with the standard plug, three-core cab tyre sheathed flexible is recommended. Each of the main conductors is to have a minimum sectional area of 0.15 square inches, and that of the third or earthing conductor must be equal to a 7/16 stranded cable. The approximate overall diameter of such a cable is 1.75 inches. For use in garages where cars with lead plate batteries are charged, it is not usual to provide for heavy boosting charges, and a smaller size of three-conductor cable is sufficient, and the committee recommends one having an overall diameter of approximately 1.31 inches.

PLUG. RECEPTACLE.



Sectional Drawing of the Standard Charging Plug and Socket Approved by the English Electric Vehicle Committee.

Although the committee specifies a minimum sectional area in the main conductors for the larger size of cable of 0.15 square inches, with an approximate overall diameter of 1.75 inches, in its summary of the two alternative sizes of cable to be standardized it provides in the larger pattern for cable with main conductors of only 0.10 square inches, and with an over-all diameter of 1.5 inches.

The cable-gripping device can be followed in the drawing. It consists of a sleeve of gun-metal or malleable iron screwed on to the back portion of the plug, with a terminal to which the earthing conductor can be attached. The conical insulating split sleeve, forming the packing in the gland, is so made as to fit the cable accurately. With regard to polarity, it is laid down that the central plug and socket contacts should be the negative pole, and that the terminals should be marked + and — to correspond with the polarity of the contacts.

Information as to charging equipments is being prepared for the committee by two of its members who are representatives of the B.E.A.M.A.

Electrolytes Initiate at Cedar Lake

Among Chicago's many organizations there is one known as the Electrolytes; composed entirely of men actively engaged in the electric vehicle and allied industries. This organization, although comparatively new, has made rapid strides toward developing and fostering that feeling of good-fellowship among those who are devoting a life work to the advancement of the electric vehicle industry in this country.

In furtherance of that worthy policy, the Electrolytes held their first outing and field day exercises at Cedar Lake, Indiana, on Saturday, August 20.

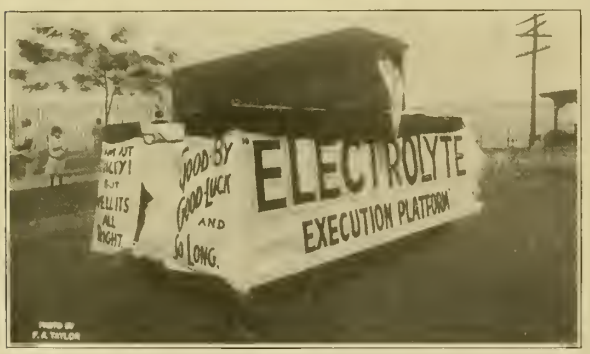
The festivities started at one o'clock with a unique parade which assembled at the corner of Michigan avenue and Twelfth street, continued south to Cottage Grove avenue and 35th street. The procession included members, candidates for initiation, and several decorated floats, exciting considerable interest among spectators. The "Hungry Five," too weak to walk, dispensed popular airs, while the German Band delighted the populace with its rhapsodies in joyful anticipation of a day off. Attracting widespread curiosity was the mysterious "Execution Platform," on which rode in solitary state the renowned H. B. Cohn, perched upon a shrouded coffin.

When Cottage Grove avenue and 35th street was reached, the procession broke up and waiting automobiles took the entire party to Cedar Lake. The ride was rapid and devoid of any mishaps.

On Sunday morning the day's events were started with a seven-inning baseball contest or rather a burlesque on our national pastime. For the benefit of those who care little for the fine points of baseball, another little event was "pulled off" while the town authorities were elsewhere. C. B. Frayer and Tom Wright delighted the seekers of white hopes by giving a splendid and exciting exhibition of boxing and wrestling; a draw as the result.

At the conclusion of the ball game, the whole party, in number about fifty, sat down to one of those famous McLaughlin chicken dinners—and who could not enjoy a chicken dinner after such a morning's enjoyment.

After the noon day repast, work began on the thirteen initiates, and they were put through their



Execution Platform on Electric Float

stunts to the immense amusement of those not undergoing the ordeal. Everyone was in costume and the effect of the black robed figures and masked faces was greatly enhanced by the rustic environment. The ceremonies being concluded, many jollities were exchanged as a result of the pranks and antics of the unfortunate initiates. Then it being close to five o'clock in the evening nearly everyone was ready to leave, and the return to the city was again made in automobiles.

The whole affair was a pronounced success and from the experiences of the members it accomplished

Electrolyte Degree Team.

even more than was hoped for. Many new acquaintances were made, old ones renewed and casual ones were strengthened. Big men and little men met and profited by the cordial and sympathetic handshakes of those engaged in the same calling. Anecdotes told and personal experiences recounted served to break down the barriers of reserve. And when the start for home was made the Electrolytes were a band of brothers, not competitors. For the part they have elected to take in easing up the strife of business and promoting good-fellowship among competitors and associates this new society should receive many congratulations. It represents a real fellowship club and should include all those who are directly connected with the electric vehicle industry.

Discourage Use of Truck Trailers

Inquiries addressed to members of the National Automobile Chamber of Commerce regarding the desirability and economy of using trailers with standard motor trucks have been answered in detail by several electric vehicle manufacturers.

The preponderance of opinion is decidedly against the practice except in very favorable conditions, such as on level, smooth, hard roads, with slow speed and proper handling. Given such conditions the standard truck may be used successfully for hauling trailers, but in no circumstances should a trailer be used without the assent of the manufacturer, as the guarantee does not contemplate such use. In any other condition the practice is of very doubtful economy; therefore truck manufacturers do not encourage the use of trailers unless they examine the field of operation and know that their trucks can handle the work with trailers.

The standard truck is designed for a definite load and speed and as a rule is not rugged enough for this service, which is most likely to be done outside of cities, where roads are usually poor and grades very steep.

For use as a tractor, the truck should have a powerful motor, strong construction throughout, especially liberal bearing surfaces, and a control that will engage and start the load without a jerk. The horsepower developed and the gear ratio should be proportionate to the weight of the vehicle and trailer with loads. The battery capacity must also be increased proportionally.

Chicago's Motograph Electric Sign

A Mammoth Feature of Attraction Giving Publicity to Electric Vehicle Service

BY ARTHUR WELLS

THERE is always something new under the sun (or rather the moon) in electrical advertising, and just at the present the latest development of the electric sign can be found in Chicago—"the city of electric signs." In operation only a trifle over one week it has been viewed by hundreds of thousands of pedestrians and automobilists. An Englishman representing a large syndicate of stores on the other side, and who arrived from England only last week, was exceptionally enthusiastic over this sign and made the remark that England is far behind this country in the matter of electric signs and electric sign development, and has ordered one of these signs to be erected in London at an early date.

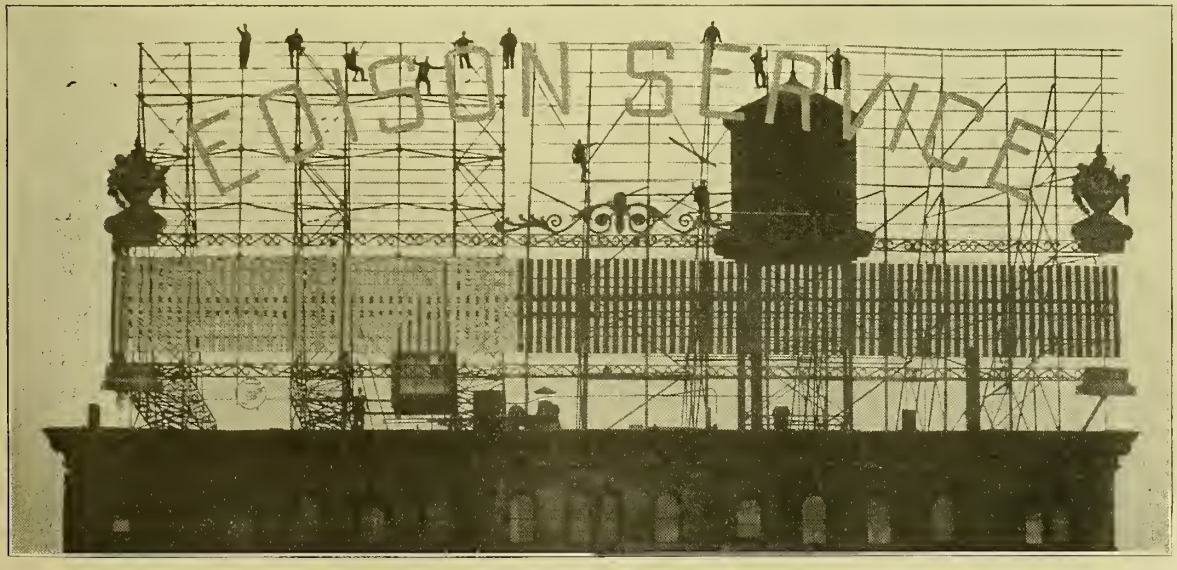
Motograph Sign at Night.

This mammoth motograph sign, the largest of its kind in the world, occupies one of the most prominent positions in the City of Chicago—at the head of Michigan avenue at Randolph street. Its builders, the Federal Sign System (electric) are to be congratulated for the excellent workmanship displayed.

The structure is 50 feet high and 130 feet of its length shows down Michigan avenue, while 12 feet follows the turn of the building upon which it is erected and shows down Randolph street. It is open to an unobstructed view of over a mile looking north on Michigan avenue, facing the entire open space occupied by Grant Park. The letters on the motograph portion are 12 feet high and the entire sign is easily read over a mile away.

This sign contains approximately 10,000 Mazda lamps of 5 and 10 watts each. More than 100,000 feet of wire—about twenty miles—have been used in connecting it up.

The attention getting feature is the motograph construction which is operated by a perforated roll having a capacity of about 125 words, moving in a continuous line across the board, each letter taking about four seconds in its travel across the board. The copy is changed every evening. Each roll carries a sales talk describing some particular branch of the Commonwealth Edison Company's service. The motograph feature is operated in a manner very similar to that of a piano player. The rolls are made of a specially treated paper and the letters or characters are punched by means of a special perforating machine which operates



View Showing Construction of Immense Electrical Publicity Sign.

similarly to a typewriter. When the sign starts to run, the perforated roll is drawn between the grouped terminals of the thousands of lamps, which are symmetrically arranged all over the central space of the great sign, and the other terminals of the electrical circuit. Small spring contact brushes drop through the passing perforations and momentarily light the corresponding letters on the face of the sign.

Since its erection, the sign has been the feature of the downtown section of Chicago and it has shown its value by the number of people which it forces to stop along the street and on the corners to read its entire message. Reports have been received that it can clearly be read for some distance out upon Lake Michigan, and so far it has proved itself the most desirable publicity possible. The effect of letters of fire twelve feet high running around the corner of a building is something difficult to imagine and truly very "hermanesque".

It is the idea of the Federal Sign System (electric) ultimately to contract with general advertisers for advertising on this mammoth sign, and it should prove one of the most valuable mediums ever erected.

This wonderful publicity medium is of especial interest to those connected with the electric vehicle industry in that on various evenings a special perforated roll features the advantages of electric vehicle service. Without a doubt many have learned for the first time the real advantages of the electric which their home lighting company has seen fit to guarantee through this electric sign medium. This is a splendid example of central station co-operation. It gives the public greater confidence in the consideration of buying an electric; it paves the way for the electric vehicle salesman.

The following editorial which appears on the sign was by Dana H. Howard, general publicity agent of the Commonwealth Edison Company and represents an excellent specimen of advertising copy, simple, brief, truthful and precise: "The electric car is always ready to go and goes readily. The electric car is a Pullman palace without dust, noise or porters. The electric car runs easy and is easy to run. The electric car cost is little and its maintenance is less. The electric car is its own bookkeeper. Every month you can know just what the electric car will cost. The electric car is the business man's car. The electric car is a luxurious economy for pleasure, for business, for hills, for boulevards, for father, for mother, for everybody, everywhere, every time—the electric car.

Our vehicle expert is at your service.

Call Commonwealth Edison Company—Electric Vehicle Department."

It might be a good suggestion that electric vehicle manufacturers adopt this particular copy as standard, for it surely conveys the exact status of this individual service, and is as easy to read and understand as the electric is to control and maintain.

Team Hauling Wasteful and Expensive

The Chicago Municipal Markets Commission has issued a preliminary report in which it is shown that the average cost of deliveries by department stores, grocery stores and meat markets is approximately 8 cents by motor and 16 cents by horse. Exhaustive studies made by the commission showed that the city consumer pays an average of $1.90 for produce that the farmer sells for $1: that it costs more to haul 100 pounds of potatoes, fruit or other products for a distance of 5 miles from the docks to the retail store than to ship them by boat from Michigan to Chicago; that it costs 50 cents to deliver a ton of coal from the railroad tracks to the consumer in the business district of the city, while it costs only $1.05 to ship the coal 400 miles by rail from southern Illinois to Chicago. The commission estimates that 1,150 tons of freight are hauled daily in an area of 2 square miles in the heart of Chicago. The commission states that there are approximately 1,000 teams engaged in hauling food products, exclusive of the delivery service of the retailers, and that to make a profit for their owners single teams must earn $6 a day and double teams $8. The report further states that:

Team hauling is decidedly antiquated, wasteful and inadequate. Because of the congestion existing in the streets of the central business district and the consequent inadequacy of the streets to afford free passage to vehicles, the average wagon or truck spends about one-third of its time actively hauling commodities and two-thirds in waiting, loading, unloading and in delays to traffic.

Animal transportation is out of place and an archaic survival. Under present methods of hauling, food products are invariably exposed for hours to the heat of the sun. The motor truck as a carrier of food products assures to the consumer better food, lower prices and a lower cost of hauling. Detailed comparisons showing the cost of hauling by horses and wagons and motor vehicles indicate that the average cost of hauling in the city by motor is 11¼ cents per ton mile as compared with 17¾ cents by horse, a saving of 36 per cent.

Plans Lincoln Highway Tours

Great success has been had in the use of the electric vehicle for touring purposes, which has been made possible through the improvement in battery design and application, and the greater availability of charging facilities. Now the electric vehicle can maintain as high average speed over all conditions of roads as any other type of touring car.

Plans are now being made for a number of long distance trips at the time of the fifth annual convention of the Electric Vehicle Association to be held October 19, 20 and 21, at the Hotel Bellevue-Stratford, Philadelphia. Large numbers of electric vehicles will make runs to Philadelphia from such points as Baltimore, Washington, New York, Boston and Pittsburgh.

The garage and rates committee of the Electric Vehicle Association, chairmaned by John F. Gilchrist, vice president of the Commonwealth Edison Company of Chicago, is preparing an unusually interesting and complete report supplemented by a map indicating the electric vehicle charging stations along the entire route of the Lincoln highway from New York to San Francisco, together with similar information for the roads tributary to the Lincoln highway.

Arrangements are being made to drive several electric vehicles, both passenger and commercial, from coast to coast over the Lincoln highway during the year 1915, which argues well for the touring ability of the electric vehicle.

Oil rots concrete. If oil is allowed to remain for any length of time on a garage concrete floor the cement facing will show unmistakable signs of disintegration. For this reason it is of the utmost importance that all garage floors be kept at all times free of oil and grease.

Low Priced Electric Enters Field

Milburn Wagon Company Announces Three New Models

THE most recent development in the electric vehicle field is the production of the Milburn light electric by the Milburn Wagon Company, Toledo. The car will make its appearance early in October in three models—a coupe at $1,485, a roadster at $1,285 and a delivery wagon at $985.

Of equal importance to the lightness and quality of the new car is the low price at which it will be marketed. The makers claim that improvements in construction and design give this light electric all the quality and general excellence of the conventional heavy electric car with a saving in weight of approximately 2,000 pounds. This allows the reduction in price at the same time proportionately lowers the cost of maintenance and operation.

The Milburn electric is distinctly an innovation in that it is the first high class electric vehicle to come within reach of the person of average means. Although there have been frequent rumors that various manufacturers were considering building low-priced electric cars, this is the first to be actually offered to the public.

Owing to the enormous capacity of the factory and scientific modern quantity production, the Milburn Wagon Company is able to offer these reasonable prices. Consequently a tremendous sale is promised in fields heretofore untouched by electric vehicles.

As the Milburn Wagon Company is one of the country's oldest, soundest and most conservative vehicle manufacturers, it may be taken for granted that its present product is not only sound, but that it is well backed and will be intelligently marketed. To assist in the manufacture and sale of the new electric, several men who have occupied conspicuous places in the industry recently have become affiliated with the Milburn Company.

As the company has long been a producer of high class bodies for the automobile trade, this branch of the work is by no means experimental. It also transpires that the development of the chassis itself has been in progress during the past two years, during which time numerous experimental cars have been in the service of the company.

The coupe body is exceedingly graceful with long stream lines, and although it is somewhat smaller than the conventional heavy one usually found on electric cars, it provides comfortable accommodations for four persons. Large doors, 26 inches wide and sashless glass windows add to the attractive exterior. The body is painted in a dark rich blue.

The interior is handsome and luxurious, containing the complete equipment found in enclosed bodies of the highest type. The deep upholstering is of high grade French fabric, woven according to the specifications of the Milburn Company especially for this car. Both doors, as well as the front and rear windows, are provided with mechanical window lifters.

The body is low hung on cantilever springs. This low center of gravity provides a factor of safety which appeals strongly to women, reducing to the minimum the possibility of upsetting or skidding. The manufacturers state that preliminary tests have shown the reduced weight of the Milburn makes it exceptionally easy to control in crowded traffic.

The coupe weighs approximately 2,000 pounds and has a wheelbase of 100 inches. With its battery of twenty cells, Philadelphia, it attais a normal speed of 17 miles per hour and a maximum of twenty. It has a mileage ranging from 60 to 75 on a single charge. The rated battery charge is 180 ampere hours.

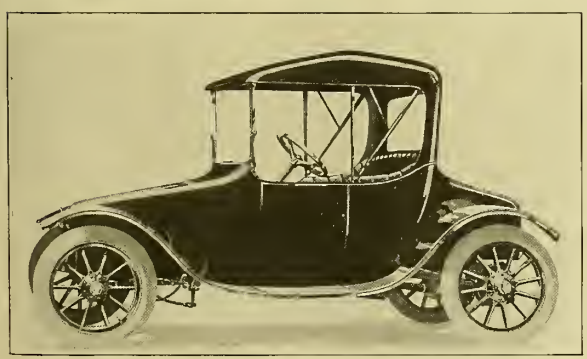
The General Electric motor is of a high speed special design. The controller, also General Electric, is continuous torque, drum type, non arcing, four speeds forward and two reverse. Both speed control and steering are by conveniently arranged horizontal levers.

The front axle is equipped with Bower Roller bearings while the rear axle, which is of the three-quarter floating type, has shafts of chrome vanadium steel and employs Hyatt heavy duty roller bearings. The drive is of the direct worm type with no universal joints, and is supported on Hess Bright ball bearings. The springs are of the full cantilever type of chrome vanadium steel and are self lubricating.

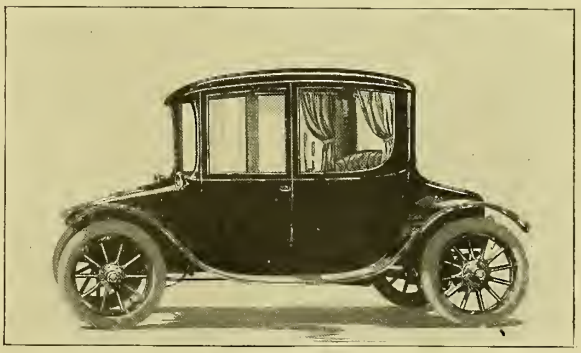
Twelve inch internal and external Thermoid lined brakes are on each rear hub of the car. None of the braking strains are taken through the worm gear or motor.

A feature which is calculated to eliminate unnecessary waste of power is an automatic alarm which rings if the brakes are set while the power is on.

The Milburn roadster has much the same specifications as the coupe except for 100 pounds less weight



Milburn Electric Roadster.



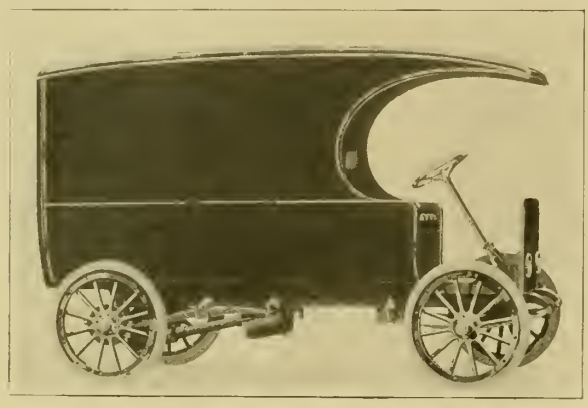
Four Passenger Milburn Coupe.

and twenty-five ampere hours greater battery capacity, giving a mileage of approximately 75 under normal driving conditions. The normal speed of the roadster is nineteen miles per hour with a maximum of twenty-four.

The roadster possesses an individuality of its own in the electric vehicle field. The steering lever gives way to a sixteen inch wheel of the worm and nut type and a rain vision wind shield with a special one-hand top and curtains adds to the distinctive appearance of the car.

The Milburn delivery wagon, with a wheelbase of 90 inches, has carrying capacity of 750 pounds in addition to the operator and an extra passenger. The price of $985 covers the chassis only, due to the wide variety of body types required for various conditions of service. Bodies of all types are furnished at prices ranging upward from $100.

The delivery wagon has a battery capacity of 180 ampere hours, a normal speed of 14 miles per hour and a maximum of 17. The car has a mileage of 40 to 50 on a full battery charge.



Milburn Electric Delivery Wagon.

The equipment of all the models is complete, consisting of two six-inch front lamps, tail lamp, two inside corner lamps for the coupe, bell voltmeter, speedometer, eight-day rim wind clock, tire pump, hydrometer, jacks, tooks, etc.

The tires included in the standard are Goodyear special electric, 30x3½ inches. Motz Cushion tires, 32x3½ are optional at an extra charge.

War Will Not Effect K. W. Company

The K. W. Battery Company, Chicago, is the sole representative for the United States and Canada of Gottfried Hagen, Koelner Akkumulatoren-Werke, established in 1829, Cologne, Germany, the oldest storage battery factory in existence and recognized as a pioneer in the storage battery industry.

The Gottfried Hagen Koelner Akkumulatoren-Werke are under the technical management of Dr. E. Sieg, who is a world-wide known authority on storage batteries. Their product shows the perfection in regard to both durability and capacity. Their storage batteries have been in the service of the German and Danish Governments for more than fifteen years and are still giving satisfaction. The uniform standard quality of these batteries has caused them to be generally adopted for the electric taxicab service in Berlin and other large European cities and they have made a splendid record under these most strenuous conditions of service.

The K. W. plate is of the thin or large surface type, which the Gottfried Hagen Koelner Akkumulatoren-Werke have advocated and successfully manufactured since many years. Its dimensoins, identical for both the positive and the negative electrode, are as follows:

141 mm.—5¾" wide
219 mm.—8⅝" long
3¼ mm.— ⅛" thick

The positive plate is most conservatively rated at 25½ ampere hours at the 6-hour rate, but its actual capacity will be always found to exceed this rating quite appreciably. The negative element has a very large surplus capacity.

The greatest difficulty in storage battery manufacturing and the stumbling block of most storage battery manufacturers has always been the problem how to produce continuously and uniformly an excellent storage battery plate. It is quite a different thing to produce a good storage battery once than to be sure to duplicate it again and again at the same standard of quality. A storage battery plate undergoes about twenty operations from the state of the raw material until the state of the finished product. All these operations have to be varied in an adequate and competent manner according to the conditions of temperature, humidity, etc. Furthermore, the raw materials themselves as lead and lead oxides, which form the basis of the manufacture, are in most factories subject to quite considerable fluctuations. This is the cause of many failures.

The Gottfried Hagen Koelner Akkumulatoren-Werke claim they have succeeded in overcoming this difficulty. They have their own large lead works, from which the storage battery works are supplied and they have a highly trained and competent staff of chemists, electrical engineers and experienced foremen, working under the directions of Dr. Sieg.

The manager of the K. W. Battery Company, Edward Sokal, has been for many years connected in leading positions with storage battery manufacturing and engineering abroad and in this country. They maintain a competent inspection and engineering department under his supervision and its services and experience are without charge.

The company's officers state that present war conditions in Europe are having no detrimental effect on their business. Shipments are being received weekly and it is stated that the company has enough stock reserved in America to fill all orders.

Proper Loading Means Economy

It is not often a difficult matter to train a former teamster to readjust his ideas of loading in accordance with the requirements of the motor truck, yet proper precautions taken in this respect are particularly fruitful in prolonging the life of the tires. It is always a mistake to permit convenience in loading to offset the rule that the load should be uniformly distributed, as unequal loading of the tires always leads to unequal wear. In the same way it is poor economy to permit a truck to be driven at high speed even when unloaded, as the wear on the tires under such conditions may be easily equal that sustained under a normal load when driven at a reasonable speed.

Practical Ideals in Electric Vehicle Promotion

A Paper Read Before the E. V. A. New York Section

BY ELLIS L. HOWLAND

IN APPROACHING the subject of electric vehicle sales ideals, one should pause and pay tribute to the many who floundered in the darkness of the early days, but through their errors and struggles blazed the landscape with warning tombstones and beacon lights of experience.

No consideration of motor vehicle ideals should neglect a preliminary analysis of the industry's history. American progress furnishes no parallel for rapidity of evolution and nothing short of a miracle could save it from many an error which slower-moving industries may have escaped. It is not surprising that its industrial and mercantile phases have clashed all along the line, that at times sales zeal has outstripped mechanical progress, or that stupendous blunders in adapting the motor vehicle to the world's transportation problem have caused setbacks. And yet, the actual progress made is little short of being marvelous.

Rauch & Lang Electric Float, First Prize Winner at Baltimore.

Opinions may differ as to whether it was fortunate or otherwise that the first automobiles were pleasure cars and made their initial appearance on a race track. It tremendously impressed the whole future of the industry; stamped speed and luxury and sport and extravagance as the ruling factors in its evolution and sale and brought into the commercial side of the industry a type of salesman with selling ideals totally unfitted for the latter-day conditions. There was little of the economic in the early selling considerations and it has been truthfully said that till very lately automobiles were bought rather than sold.

In the early days of the industry, vehicles followed the bent of the designer's fancy rather than the buyer's necessity. The buyer knew little or nothing about the device and left the manufacturer to produce whatever he thought best. And the user bought it as it stood. Very commonly the gasoline types led the procession because electric vehicles of a practical type could not be made till the genius of the battery men had evolved practical power plants and motors that were reasonably dependable. And when they were evolved, speed appeared to be attained more easily from the burning of gasoline than the chemical disintegration of electrical energy. Besides, with the lay mind constituted as it was—and is—the fundamental operation of the gas engine and its adaptation to motor vehicles was less intricate than the elusive electric current

To electrical people it seems different—those who know ohms and kilowatts and amperes when they meet them—but to the average man they are creatures of mystery and consequently things to be shunned. An extract from a recent food trade publication indicates this and reads as follows:

CLEAR AS MUD.

Answering your question "What is a kilowatt?" a kilowatt equals 1,000 watts. One watt represents the amount of work which is being done when a current of one ampere flows against the resistance of one ohm; we trust this satisfactorily answers your inquiry.

And so, till the electric vehicle could read its title clear from such mystic things and prove itself by actual performance, its progress as against the gas car was slow. Furthermore, salesmanship of the automobile type was hardly suited to the technical qualifications which are the working equipment of the electrical machinery salesman. From a selling standpoint it is probably true, as one man said to me a few days ago, that when it came to the commercial vehicle, the gas car salesman tried to sell his customers automobiles and the electric car salesman electrical machinery—both failing to arrive at the exact middle viewpoint of the business man, who didn't care a snap about anything but the purchase of a practical, economical, understandable and efficient delivery utility.

And so it took time for all forms of motor vehicle salesmen to get the viewpoint of the buyer, once that buyer became a rational thinking being rather than a wild enthusiast for a speed machine or a social extravagance—and he did become rational some years ago. The result is that the salesman of the past is obsolete and things which once were mistaken for salesmanship are found to have been only successful order-taking. Much of this changed attitude is due to the evolution of the commercial vehicle. Early purchases of pleasure cars were with the extremely rich, though gradually the field widened, till it embraced the well-to-do—and perhaps some of them were not so well to do as they thought. The evolution of lower priced cars expanded the field and, unfortunately, increased the supply of mortgages. Even now, there are not much more than one per cent of the people of the country owning automobiles.

The man who bought pleasure cars because they

pleased his passing fancy and ignored cost, will split hairs in the purchase of a motor truck. It must "make good," like any other element in his commercial establishment. As he became more familiar with trucks his eyes opened to how extravagant he had been toward pleasure cars and his attitude toward both underwent a tremendous change. His new address was "Missouri."

Then again, the introduction of the motor truck faced an obstacle far more serious than did the pleasure car. Men of means wanted pleasure cars; they appealed in many ways over the horse. Those same men did not want motor trucks. They were entirely contented with horse transportation. For years it had served their necessities with entire satisfaction. Their whole transportation problems had been adjusted on the basis of the horse and their ideas of economy and competitive influence ran in grooves of horse service. They had millions locked up in horse-drawn equipment and were reluctant to "junk" it all. Besides, there was something startling in the idea of spending thousands for a delivery unit, instead of hundreds. It was all right to claim that one motor truck could displace three horse trucks, but to the business man that meant the reduction of his flexibility to a third, and it tripled the responsibility, of each unit of his plant. If one horse went bad in his equipment of ten, he was handicapped only a tenth of his capacity; if it all depended on three motor trucks he would be crippled one-third.

Now these were not wild vagaries of a cynic and scoffer, they were real practical considerations of a practical penny-counting business man and before he would dispel them from his mind he insisted on being shown that the new device was efficient, safe, economical, dependable and permanent. Early engineering fell down deplorably in meeting his mental attitude and salesmen mistook his caution for crankiness or a mild form of insanity. Self-complacency of the manufacturer and his salesman combated what might have been made a helpful co-operative spirit on the part of the future buyer and it is not surprising that much prejudice was created which has required years to change. It is not surprising that finally the most successful truck salesmen—and designers for that matter—wisely discovered that the sooner they forgot all they had ever learned from the pleasure car, the sooner they might make progress in the installation of motor trucks.

Both the buyer and the seller started the process of motor truck installation on false premises. The buyer judged everything in the light of the horse and the dollar-and-cent cost basis. He knew what it cost him to perform his delivery by horses—or thought he did—and he insisted on knowing in advance just what the motor truck would cost. Foolishly, the average truck salesman accepted the challenge and with unbounded confidence in his product, resorted to the most fanciful claims. His zeal outstripped the mechanical perfection of his product and the result was a lot of unfulfilled promises which created the serious and deeply intrenched prejudices his successors have been trying ever since to eradicate. Neither buyer or seller discovered till after much experience that the motor truck is not necessarily a creature of dollar-saving; especially if the equipment is to be so commonly a misfit as it proved to be in hasty installations.

The unit for judging motor trucks should be efficiency first; economy of operation second. As fairly judge the electric light by the records of cost of the tallow candle and the oil lantern. Motor trucks may or may not save money in delivery. It is proven to the general satisfaction, however, that they do mean better service, quicker service, more reliable service and more elastic service in emergencies. The horse has his limitations and humanity demands their observance; the motor truck has no limits within mechanical extremity.

Motor truck designers have learned their lesson as well as the owner. They know that progress will best be served by adapting their product not to their preconceived theories but rather to the business man's needs. So far as the chassis and power plant go, the business man knows nor cares little about technicality, so long as it works dependably and with reasonable economy. Arguments of technique interest him little, but requisite capacity and power are big factors. He is willing that the builder make a chassis based on mechanical practice, but he prefers to have the body designed for his peculiar needs. He has learned much about tires and, so long as standardization has left him a free field there, he proposes to buy tires on an experience basis, without much regard to the ruling thought in the chassis.

The buyer made the daily error of sticking to his horse ideals and trying to route and load motor trucks on the old basis. Hard-headed experience has pointed out to him his blunder and both he and the maker are now agreed that their mutual interest demands that installation he intelligently gauged by the task on the one side and the capacity of the truck on the other, free from other complications. More attention is being applied to loading and unloading and routing efficiency than ever before and the body builder has come into the field as an entirely distinct factor in successful motor truck installation.

Someone has said that "salesmanship is the art of changing people's minds." I would add to that: "and keeping them changed." Motor trucks are not sold unless they stay sold. If all the educational effort to convince the business man that he can more prudently use motor trucks than he can stick to his old equipment results in the sale of only one truck and that, by reason of unintelligent installation, is a constant misfit for the owner, the seller may as well call in the assignee. A few score of them have. Those who remain and hope to continue to, realize fully that there is a mutuality of interest between the buyer and seller of motor trucks which extends far beyond the actual transaction and that the rewards of the business lie in the continued reputation of the truck for reliability and efficiency.

But even this has not always been intelligently appreciated. The over-zealous salesman has waved the magic wand of "service" before the eyes of the prospect to such an extent that in making good his representations, many a promising enterprise has gone into the great beyond with a sad train of creditors and stockholders and owners to mourn it. But the experience has not been lost on the survivors. Both buyer and seller have come to pretty common agreement that there is no more reason why the manufacturer should, at his own expense, make good every failure of the truck—possibly due to the unintelligent use of the buyer and his drivers—than that the grocer who sells me onions should stand by and see that they

are properly cooked. Structural defects are, of course, the fault of the maker, but beyond that the owner ought to be responsible for his own inefficiency, though, naturally, he must know that the maker is ready to aid him with advice and reasonable stocks of duplicate parts.

In this respect, the electric vehicle occupies a vastly better position than the gas car. However intricate ohms and amperes may be, in a practical way, the electric vehicle has the gas car outstripped for simplicity. There is no denying the mechanical axiom that a rotating part is always superior in mechanical efficiency to a reciprocating one; that steady strains are less liable to accident than spasmodic ones. Then again, the electric vehicle is virtually an aggregation of proven units, manufactured by specialists and more or less available in the market for quick repair and installation. Given a chassis, a set of wheels, a battery, a motor and countershaft, controllers, a pair of chains and a body, an electric truck is virtually complete. Each unit is so compact as to appeal to the efficiency sense of any business man who understands the virtue of simplicity and the responsibility for each factor rests not so much on one maker as on a number of specialty makers.

This fact has given rise to the proposition of eliminating the truck manufacturer and reducing the electric truck problem to a mere matter of assembling standardized units to fit any special requirement. More than one mercantile concern has already built its own truck equipment from standardized parts and the prediction is heard that some day a buyer will merely employ an engineer to analyze his needs, outline the needed size of units, draw a specification of standardized factors and build electric vehicles, much as the cross-roads blacksmith built farm wagons. Opinions differ as to whether or not this may become practicable. I have heard it ably argued both ways, but it is a trend which the manufacturer of trucks in the future must reckon with and meet in framing his mercantile ideals.

Business men have, as I have said above, learned a great deal about motor trucks. They know as much—sometimes more—about them than the builders, and it should be a hopeful sign to the industry that the more an owner knows about motor trucks the more enthusiastic a booster he is. The best prospect a truck manufacturer can have is the man who has learned how to use his trucks and knows their capacity. But one common agreement which seems to pervade even these champions is that motor trucks cost too much. Nor is this said in a carping spirit, but after mature deliberation and experience. Reduced to its simplest terms the problem is this—and it might as well be admitted—that motor trucks cannot be built and profitably sold at a price which business men as a whole agree they can afford to pay for them. I know that individual instances will deny this, but as a general proposition, it represents the reason why motor trucks, with all their known virtues and advantages, are not more commonly accepted as the units for performing the world's haulage.

Far-sighted factors in the industry have long realized the essential truth of this fact and have been steadily seeking to reduce costs, and with an appreciable degree of success. If companies could be sure of markets for volume production sufficient to justify economic machinery, specialized processes and quantity contracts in material, I have no doubt costs would be greatly reduced and the buying disposition of the business man greatly stimulated. It's the same old story of the egg and the hen—which came first? Should large standardized production stimulate the sales, or should the large orders justify the quantity production? Whichever way it is regarded, it represents a great hope for the future. Just as Henry Ford and John N. Willys have succeeded in reducing their production costs by concentration and quantity production, so the motor truck trade will ultimately bring down truck costs to the point where the power vehicle will displace horses in far greater ratio than they have in the past. Standardization is a step in the right direction, for if quantity production of whole trucks be delayed, the quantity production of parts may solve the problem of bringing the truck within the range of the business man. I am credibly informed by manufacturers that already, the saving in production cost of trucks made in 100-truck lots is probably a third from the cost of 10-truck lots.

The truth is also fast dawning that early conceptions which regarded the truck body as a part of the truck were wrong; that efficiency is largely promoted by selling chasses complete and considering bodies as adjustments to individual instances. It not only relieves the manufacturer of maintaining expensive body shops, but it aids materially in making his truck fit peculiarly into the service for which it is intended.

The electric truck has been blessed with an ally of incalculable value—the central station—while the gas vehicle manufacturer has been forced to make his advance alone and often against the antagonism of the gasoline producer. Central stations are vitally interested in the promotion of electric vehicle installation; it means an immense outlet for their surplus current and ultimately may prove one of the most productive branches of their business. Fortunately they have commonly been managed by business men of ability and far sightedness, and what the electric vehicle industry owes to their assistance no one can calculate. They have made current available at attractive rates; they have liberally aided in advertising and selling electric vehicles; they have lent their local influence—and it is a big factor in establishing confidence—to the electric vehicle salesman and they have aggressively extended the battery-charging facilities so as greatly to expand the practical working radius of the battery-driven vehicle. Their substantial influence has done much to steady the growth of the industry and keep it out of the pitfalls which gas-car inexperience in commercial economy tended to transmit.

One important truth which has dawned on the latter-day salesman is the fact that frankness with the prospect pays. The typical sales manager of the past has judged his salesman by the aggregate of orders on the book and given far too little value to the missionary efforts of the salesman. Fortunately much of the necessary educational work has already been accomplished and today the electric vehicle has facts and figures which will convince most fair-minded men of what they may expect from truck performance. I understand that your own engineers have brought statistical tables to a high state of perfection and reduced the uncertainty of current cost to a minimum. The value of this, plus the testimony of men who have successfully used trucks, renders the future problem

of the salesman one of comparative simplicity and I have no doubt will react in much more profitable transactions in the future than in the past.

Advertising in general is nothing whatever but printed salesmanship, and whatever of intelligence actuates the movements of the salesman is quite as applicable to the advertising man and his campaign. And yet, more money has been wasted in advertising automobiles than perhaps in any other way. Advertising rightly written and placed is tremendously valuable, but most advertisers expect entirely too much from it. It may not sell motor vehicles, but it can pave the way for the salesman to do so and make the first inroads for future receptiveness of sales arguments.

Take the matter of commercial vehicles. The only man who will ever buy them is the business man, and the only considerations which will influence him to do so are business reasons. Already the matter is in his mind and doubtless he has given much thought to it. He has watched his competitors buy and operate trucks and he has probably been bombarded by 57 varieties of salesmen, to say nothing of receiving reams of literature. He fully admits that some day he will buy motor trucks, if it can be shown him that they would be profitable in his industry, and whenever his eye falls on a scrap of information or an advertisement concerning motor trucks he absorbs it, for just whatever force it may have.

You may advertise to that man for months without making the slightest impression on him. At least, you don't think you have made any impression, because he doesn't order trucks. And then you set the advertising down as a failure. Yet perhaps it has been doing its work steadily, by the slow process of conviction. He has steadily been forming an opinion of you and your truck and when the day comes, when he feels that it is prudent for him to buy the truck he has had in mind all the time—for it takes a business man some time to solve as serious a problem as changing the character of his transportation—he asks you to send your catalogue or your salesman down to talk it over. And then, the quiet incisive influence of your advertisement proves itself.

Just what kind of argument should go into truck advertisements? I hear you ask. Business argument —of efficiency, and economy and reliability and superiority. Keep the prospect informed of what your trucks are doing; not necessarily what the other fellows' have not done. Point out rational business reasons why motor transportation is superior to horses; what it costs; how much it has reduced costs for individual owners; how trucks are being adapted for new uses; what tangible improvements are being made in them; scientific adaptation of trucks to more efficient delivery systems; suggest the advertising value of trucks and argue away from the claim that they are necessarily cheaper. Show trucks that look alive and point out that men who have used your trucks are buying more of them. In brief, let your copy be newsy. Credit the business man with having his mind on the business side of the topic and realize that he knows as well as you do—recently at least—that motors have come to stay and are indicative of progress.

Just as intelligent salesmanship is psychological, so is advertising. True, the business man reads during hours of his relaxation, but I believe the time to impress his mind with business topics is when his mind is engrossed in business matters. I know of no better time to preach transportation to him than when transportation problems are uppermost in his mind at his office. And yet millions of dollars in advertising space have been wasted in trying to insert motor truck ideas into the business man's head in the quiet of his library, or as he fleetingly tries to read the news of the day as he speeds to and from home.

Public interest is all very well, but the proportion of men who are to be influenced in a constructive way for the purchase of motor trucks are few and far between. With all the millions on millions of money spent in pleasure car advertising, sales have aggregated less than one to every hundred of the public; how much less general are the buyers of motor trucks. It seems to me that if I were placing a campaign for motor trucks I would seek the most direct and concentrated channels for reaching the business men as such.

Much of the motor truck advertising and more of the so-called "publicity" reflects little regard for the business man's intelligence and sense of discrimination. It is totally devoid of constructive flavor and it fails to approach his point of interest in the utility. Personal glorification of president this or sales manager that, or the swell appearance of the sky-blue-pink body of the Booster Company's new demonstrator, or the new fangled thingamajig in the transmission of the new "Jumbo," has little influence on him, unless it bears on his problem. And after all, it doesn't directly induce a decision in his mind until steady, constructive educational work has created the kind of interest in your product which will tempt him to turn to it as one of the first to examine when he thinks of actual purchases.

Newspapers, quite as much as salesman and manufacturers, have inherited bad habits and wrong conceptions from the early days of the automobile. One of them is that news columns are simply for use as press agent "dope"—something to be thrown in for full measure—so many lines of free "publicity" with every line of paid advertising space. A conception like that is hardly complimentary to a newspaper's readers. If the emanations of the press agent are of value, or constructive, or interesting, they ought to be used for what they are worth to the reader, without reference to paid advertising; if they are not, a newspaper should not litter its columns with it. I believe newspapers ought to conform to the ideals and needs of the men who buy them, quite as much as motor trucks, and it's bad practice to give away what you've got for sale.

The men who have floundered through the past deserve our gratitude; they bore the brunt of the battle, paved the way with good intentions, hung out danger signals that we might not fall where they did, improved the product, educated the mind of the uninformed and laid foundations for a commercial future that was possible only because of the lessons learned by their experience.

The New Orleans Dock Board has closed a contract for central-station energy to charge six electric trucks which will be used for haulage service on the local waterfront. The decision to use electric trucks followed after an actual demonstration of the speed and convenience with which these vehicles could be loaded and unloaded.

English Storage Battery Driven Fire Apparatus

Facts and Figures on the Operation of London's Fire Fighting Trucks

GERMAN authorities have devoted considerable attention to the question of the best form of motor fire engine, and have finally decided in favor of electrically-propelled vehicles, fitted with gasoline - actuated pumps, some gas-electric machines being also used. In London, machines in which the same gas motor is utilized both for vehicle propulsion and pump-operating purposes have been chosen, and although the early trials were not very successful, the progress made by gasoline fire engine builders has been such that a high standard of efficiency has now been reached, the modern machines being fitted with large engines, developing 65 hp. at 1,100 revolutions, and centrifugal pumps having an output of 500 gallons per minute, at a working pressure of over 120 pounds per square inch.

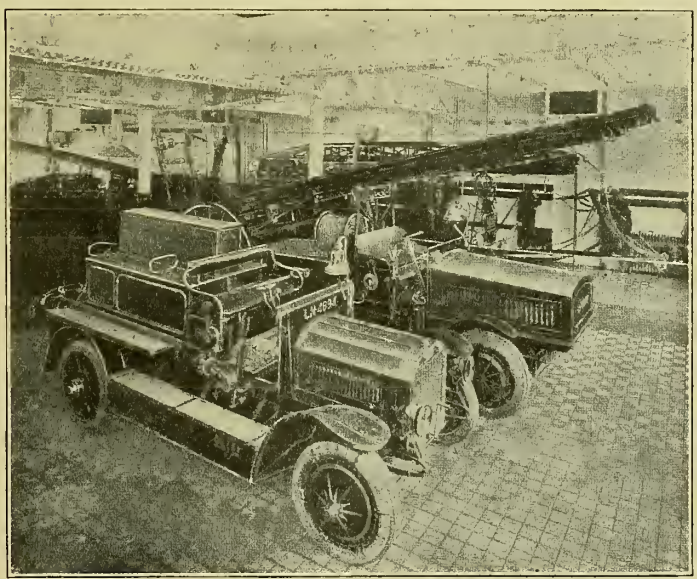
Electric Turntable Ladder Wagon.

With regard to the gas motor ladder truck, the first supplied only gave moderate satisfaction, as manufacturers generally had had no experience in the running of vehicles weighing, with load, about 5 tons, at speeds exceeding 20 miles per hour. Indeed, prior to 1910 it was considered necessary to have one spare truck for every one on duty, in order to maintain an efficient service, whereas now, only one spare in five vehicles is deemed necessary.

Later some trials were made with electrically-propelled fire wagons, these proving so satisfactory that eventually it was decided to adopt them, in a measure, as a standard for life-saving appliances in localities where the gradients are moderate. In the more hilly districts of London the stations are equipped with gasoline types, fitted with engines of about 50-hp., some gas-electric vehicles, that is, machines with gas engines as the prime mover, with electrical in place of mechanical transmission of the power to the road wheels, being, also, now on order.

The first electrically-propelled fire appliance was put into service in London in February, 1911, or about 3½ years ago. At the present time the London Fire Brigade has a total of 15 such vehicles, 11 being officially designated as hook and ladder wagons and four as motor turntable ladders. Including the headquarters of the Brigade in Southwark Bridge Road, three stations are provided with two electric vehicles each, the remainder being allotted singly to different stations.

One of the vehicles is known as the Simonis, but the majority are of the Cedes type. The latter are equipped with series-wound motors mounted in the hubs of the front road wheels, which are thus driven direct without the intervention of any gearing, the Cedes Company claiming an efficiency of from 78 to 85 per cent for its motors, which are rated at 15 electrical hp. The power is provided by a battery of 84 Tudor cells of a capacity of 200 ampere-hours at a 6-hours' discharge rate, giving a normal running output of about 30 hp. The cells are carried in trays, either under a bonnet in the front of the driver or just to the rear of the forward wheels below the driver's seat. The machines can run about 30 miles on one charge if necessary, but owing to the nature



Electric Hook and Ladder Truck.

of the service they stand fully charged ready to give out the maximum output on receipt of a call. There are electric brakes on the front wheel motors, which are valuable in emergencies, while two hand and foot controlled mechanical brakes on the rear wheels are sufficient under ordinary circumstances. The controller is of the series-parallel type, with seven notches for three forward speeds, two reverse motions and two brake positions. All the contact fingers of the controller are interchangeable and can be removed without the use of any tool. The danger of burning out of the device is thus avoided, for should a finger burn out, it can be replaced by another in two or three seconds.

The weight of an electric hook and ladder wagon ready for running, but without ladders, hose, and small gear, and men, does not exceed 3 5-7 tons, the total weight of the wagon complete being about 5¼ tons. The test requirements of these vehicles are that they shall be able to maintain a speed of 25 miles per hour on the level with a full load of ladder, equipment and firemen, or 29 miles per hour with men and equipment, but without the ladder. They must be able to climb a grade of 1 in 20 at 14½ to 16 miles per hour, while the battery must be capable of enabling a distance of 30 miles to be run on one charge at 20 miles per hour. In practice, these speeds can easily be exceeded, from 28 to 29 miles per hour being reached on the level, with plain tires, and from 26 to 27 miles per hour when non-skids are fitted. The vehicles carry a ladder capable of being extended to at least 50 feet, and are also furnished with supplementary ladders, hose and tools for getting to work from hydrants, and a cylinder holding about 30 gallons of water, fitted with 180 feet of rubber garden-hose for extinguishing small fires. This type of appliance, the crew of which is on duty night and day, is ready for an instantaneous turn-out, and only attends fires on the ground immediately protected by the station, the distance it may travel to fires rarely exceeding one mile.

The electric motor turn-table ladders are kept at the stations in localities where there are many high or warehouse buildings. These appliances, while intended, generally speaking, for attending local calls, are considered available in case of serious fires in high buildings within a radius of about five miles. Owing to their weight, which, complete in fire-attending order, ranges from 5¾ to 6 tons, it is not considered necessary to specify that the electric motor turn-table ladders, which can be safely used as water towers to a height of 60 feet, shall travel at more than 20 miles per hour, but with plain tires they can attain 27 miles per hour, or, with non-skid, 25 miles per hour. Several of these machines are fitted with 5-hp. electric motors for raising the ladders, some to a height of nearly 100 feet, an operation which is accomplished in the rapid time of 10 seconds. The motor, which takes its current from the vehicle battery, serves as a brake when lowering the ladder.

From the introduction of heavy motor fire-fighting machines capable of high speed, the problem of providing some satisfactory means of preventing skidding has, as has been the case in Berlin, been the cause of considerable study and experiment. Some mitigation of the difficulty was secured by utilizing chains festooned diagonally across the tires, but considerable damage was caused to the rubber, which, when worn, allowed the chains to come in contact with the steel rims. This caused the non-skid chains to break, and allowed the loose ends to tear the mud-guards. Other devices were tried to check the tendency to skidding, such as studded leather covers and transverse bands of steel-studded balata belting fitted into slots cut into the rubber of the tire. The latter were found to be most effective when the tires and bands were new, but gave endless trouble when partly worn. One appliance has run for a year without non-skids, but with soft rubber tires of flat tread and extra wide section, single on front wheels and twin on rear wheels. Although no skidding has taken place, there is still some doubt if motor fire brigade machines can be safely run under all conditions in London without some non-skid attachment. Mechanical front wheel brakes were tried on the appliances supplied by different manufacturers in 1910, in order, it was hoped, to obviate the effects of skidding, but while satisfactory results were obtained on tests they were found unsuitable in practice, and have now been removed, rear wheel or differential brakes having been fitted in lieu.

The difficulties with regard to skidding formerly experienced have, however, now been fairly overcome; first, by careful training and the continued experience of drivers; secondly, by allowing greater cross-section in tires, 5-inch solid rubber now being used; and thirdly, by using extra heavy leather steel-studded covers fitted on two wheels only—on the off-side front wheel and the near-side rear wheel—this corresponding exactly with the practice now followed, after similar experiments, in Berlin.

The batteries are looked after by the brigade staff alone, and, so far, have proven very satisfactory. Indeed, the battery maintenance costs have up to the present time been restricted to the renewal of the positive plates of the accumulators of one vehicle only. It may, therefore, be said that costs under this heading are only just commencing, but they are not expected to be heavy, as the officials report that by properly looking after them, they anticipate no trouble. No spare batteries are kept on hand, but, of the fleet of 11 escape vans, two are always held in reserve to take the place of any temporarily out of service at any of the stations. No spare electric motor turn-table ladder is at present available.

Current for battery charging is taken from the public supply mains in the district in which the stations are situated, the rate paid ranging from 2 cents to 4 cents per unit. Like most users of electric vehicles, the brigade has experienced difficulty in getting current at a suitable voltage. Only about 30 amperes is required for the batteries, and the maximum voltage is 240, but very few electric supply authorities in London furnish current under 400 volts, and, therefore, either a good deal of current has to be wasted in charging, or a motor-generator set must be put in, the latter meaning a considerable expense.

Whenever an electric vehicle goes out, its battery is immediately put on charge on its return, each of the stations being equipped with charging boards and leads to enable the charging operation to be carried out without trouble, and with the vehicle in position for immediate service. Hitherto it has been the practice to discharge the batteries down to 1.9 volts and re-charge them once a month. This operation is done by actually running the vehicles on the road in the

neighborhood of the stations, and as no indications of sulphating have been detected, it has been decided to increase the intervals of discharge and charge to six weeks; this will mean a slight decrease in the annual cost of current, which at present amounts to approximately $40 per vehicle.

The conditions of fire brigade work in London being entirely different from those existing in Berlin, it would be impossible to make any useful comparison with the running and maintenance costs of the vehicles in the German capital, even if corresponding figures were available for England.

From the figures prepared last year the average annual cost of an electric hook and ladder wagon, under the heading of repairs to chassis and body, and tire renewals—the figures for each not being separately available—is $125. It may parenthetically be stated that so far the tire bill, owing to the relatively small mileage that has been covered, has been practically nothing. Allowing $40 per annum for energy, and 72 cents for oil and grease, the running and maintenance costs for an average mileage of 659 miles are $165.72 per year. Taking the average first cost of the vehicle at $4,750, and spreading the depreciation over 10 years, plus interest on the outlay at 3½ per cent, there is an additional charge of $740.72 per annum, bringing the total costs per vehicle up to $740.72 per year. At a meeting of the Institution of Electrical Engineers in March last, Lieut. Sladen, the chief of the brigade, put the annual cost of repairs, including battery renewals, at $200, which would increase this figure to $815.72. Averaging, however, over the brigade's whole fleet, the chief considered that, taking into account the first cost, depreciation and maintenance, an electric escape-van and a gas vehicle came out to practically the same running and maintenance cost, viz., $750 per annum.

Comparing these figures with the cost of horse-drawn gas trucks, it has first to be mentioned that the London Fire Brigade owns no horses, but hires them from contractors at an average rate of $350 per annum per horse, this figure including bedding, fodder and harness, and the contractor taking all risks. On this basis, and taking the average cost of a horse escape-van at $325, the annual cost is as follows: Depreciation spread over 25 years, and interest at 3½ per cent, $15.46; repairs, $45; two horses at $350, $700; total, $750.46. Thus, from the financial point of view, leaving out of account the increased speed and efficiency, there is a saving in favor of the electrical vehicle.

It is useless to endeavor to work out the running and maintenance costs of fire brigade vehicles, whether horse-drawn, steam, gas, or electric, on a so-much-per-mile basis, the prime factor of importance being that such vehicles must be constantly in full working order, ready to answer calls at any time—calls that may come several times in one day, after which there may not be another for several days—the only possible way of getting any idea of the possible mileage being to strike averages for previous periods. So far as experience has gone, the average of electric fire wagons has been about 659 miles per annum—with minimum and maximum figures of 400 and 800 miles—and of gas trucks, roughly, 522 miles. It was because of the relatively small mileage that Lieut. Sladen was led to remark that "It would perhaps be a shock to those who thought they could run electric vehicles cheaply, when he told them that the vehicles in use by the London County Council cost about 27 cents per mile to maintain, and that did not include the driver's wages, first cost, or depreciation. But perhaps the feelings of those gentlemen who expected to hear something more favorable would be changed when he said that for similar gas vehicles the cost was about 30 cents per mile." The great point is that, whether the mileage be 600 miles per annum or even less, the vehicles are always ready to respond to a call, and that while they are more efficient than the old horse-drawn machines they have superseded, their annual cost is less.

On the point of efficiency, to those interested in electric vehicles it will be pleasant reading to learn that the officials of the London Brigade have no reason to regret the decision arrived at early in 1911 in favor of the adoption of electric hook and ladder wagons and motor turn-table ladders. They report that among their advantages are the facts that the vehicles can be driven by much less skilled men than are required for gas or steam machines, and that from the point of view of rapidity of turn-out they are absolutely unequaled by any other form of traction. The vehicle starts off at a good speed, and, owing to its high rate of acceleration, quickly attains its top speed, while the others require time to get fully going. It is no uncommon thing for an electric hook and ladder wagon to turn out in seven or eight seconds, whereas, with other types of motor vehicles, the best time is 15 seconds. As the runs usually only average half a mile this is a matter of considerable importance. Another important point in favor of the electric vehicle is the electric braking as an addition to the ordinary mechanical brakes. We are also informed that the vehicles are very rarely held up for repairs, and that the cost of the same, apart from the batteries, is much lower than for gas vehicles, there being no clutch or gear box, while the torque is even, so that there is but little wear on the working parts.

The following table shows the present actual number of motor vehicles—electric, gas-electric, and gas—owned by the London Fire Brigade, and the number still required to complete the conversion of the equipment:

	Present equipment of London Fire Brigade.	Still required to complete conversion of brigade from horse to motor traction.
Electric hook and ladder trucks.	11	32
Electric motor turn-table ladders	4	23
Hook and ladder trucks, gas or gas-electric	22	31
Gas or gas-electric motor fire pumps	31	63
Motor lorries	3	8
Motor tenders	6	..
Motor canteen trucks	..	1
Motor smoke-fighting trucks	1	..
Motor cars	15	..
Total	93	158

At the present time, out of the 85 stations of the London Brigade, 19 are entirely equipped with motor vehicles, and 11 partially so. New motor vehicles are, however, continually being ordered by the London County Council, and as the brigade becomes more and more motorized, it is evident that London will not only be provided with a more efficient fire-fighting equipment, but that this will be controlled from fewer centers than has hitherto been found necessary. Thus, at a recent meeting of the London County Council, the Fire Brigade committee reported that the 12 motor

fire engines and 12 motor fire trucks, which are to be acquired during the current financial year, would shortly be delivered, and that arrangements could now be made for closing three sub-stations—at Chelsea, Rushby Green and Sydenham. Tenders were also recently invited for the conversion of three horse-drawn turn-table ladders to electric traction.

From the foregoing it will be evident that the London Fire Brigade, so ably controlled by Lieut. Sladen and his officers, has not merely kept abreast of the times, but is well in advance of them, its equipment of motor fire-fighting vehicles being without a rival in any part of the world.

Satisfy Atlantic Company's Creditors

Subrogating their claims to those of general merchandise, creditors of the bankrupt Atlantic Vehicle Company, 357 Oraton street, Newark, N. J., Harold S. Vanderbilt and three other wealthy New Yorkers, the largest creditors of the concern, have agreed to take what's left of the estate of the bankrupt after all other creditors have been paid.

Mr. Vanderbilt's claim against the vehicle concern is $38,300. Those joining with him and the amounts of their claims are William Earl Dodge $37,500; Ralph Sanger, $18,500, and Leo Sullivan $10,000.

These men were stockholders of the bankrupt company and there was a question raised by the trustee as to their liability upon about $90,000 worth of unpaid capital stock. George W. C. McCarter, the trustee, has stated however, that the present action of the four would make unnecessary any suits, the outcome of which, he said, would be uncertain so far as benefiting the estate is concerned.

With the claims of these four men amounting to $104,300 subordinated to the payment of other claims, Mr. McCarter declared, the general creditors might be paid in full. The amount of the total dividend to creditors depends upon the disposition made of the claim of J. P. Morgan and Company, amounting to $10,000. The Morgan firm did not enter into the subrogation agreement.

The Morgan concern loaned the Atlantic Vehicle Company $10,000 and took as security the assignment of a contract with the Boston Edison Illuminating Company for the construction of five auto trucks. The security was impaired by the cancelation of the order upon the failure of the local company. Mr. Morgan has not filed his claim.

The subrogation arrangement is made and accepted subject to the payment of $790 to Mr. Vanderbilt, representing a surplus of the proceeds of the sale of New York Central bonds which he put up as security for a loan of $4,000 from Gray & Wilderming, New York brokers. The stock was sold, and the $790, received over and above the loan, was turned over to the trustee.

The total claims against the Atlantic Vehicle Company amounted to $133,011, including the $104,300, of the four New York men. A dividend of five per cent was paid some time ago on $28,870 worth of claims, and Mr. McCarter has recommended the payment of an additional forty-five per cent.

The amount of money in Mr. McCarter's hands is $33,012. There are unliquidated assets of the concern amounting to about $2,500. The total receipts of the estate were $45,307, according to a report filed with Referee Edwin G. Adams by Frederick W. Stelle of New York, attorney for the trustee.

The subrogated claims of the four men represented money loaned to finance the company. Some of them were secured by assignments of sums to be paid on contracts accepted by the firm before the failure. The indebtedness was evidenced by notes of the company, of which Mr. Sanger was vice-president and general manager.

The largest merchandise creditor is the Edison Storage Battery Company, which has a claim of about $6,000. The Atlantic concern went into bankruptcy last November.

Horse Efficiency Decreasing

Horse efficiency according to a certain United States Government report, is definitely limited in effectiveness by their lack of endurance, small mileage capacity and slow speed. This report covers operations on twenty-eight farms at Conway, Ark., and discloses the fact that, except when field work was very urgent, the horses were not worked more than one-third of the time, even in good weather.

A horse is paid whether it works or not. The pay is included in the interest on its value, the amount of depreciation and the cost of feed and care. This expenditure goes on daily whether the horse is idle in the pasture or doing productive work. Whenever a farmer looks out over his pasture and sees some of his horses idle, he should ask himself why he does not have them at work. In these days of high-priced feed it pays to keep only horses able to do a full day's work day after day. Economy demands further that the work must be planned so as to keep them employed as steadily as possible. The moral to be gained from this report is that farmers who use motor trucks will save money when the rainy days, which are sure to come, keep the horses in the barn. Trucks are capable of being worked day after day under the most severe conditions and do not, like the horse, have to be laid up to rest; neither do they consume fuel when forced to be idle.

The following is a comparison of truck work with horse capacity on three runs:

Item.	Run.	Squirrel Hill.	Beaver	Wilkins-Burgh.
Horse package-miles per hour		97.6	32.8	288.3
Truck package-miles per hour		284.4	654.4	556.7
Horse package-miles per day		462.6	140.4	1,395
Wagon package-miles per day		967	328	2,883
Truck package-miles per day		2,884	6,544	5,567
Number of teams per wagon		2.1	2.3	2
Ratio of truck to wagons		1:3	1:20	1:19

Standardize Commercial Vehicle Cost-Keeping

The standardization of commercial vehicle cost-keeping system is a necessity to the continued efficient operation of motor trucks. The easier it is to operate motor trucks efficiently, the more owners there will be who will do so. One of the prime requisites to the proper operation of any piece of machinery is to know as much about it as possible; not only about its mechanical make-up and capabilities, but its actual day-by-day performance. No one can judge of the merits of a thing until he knows what it can do.

Unless an owner knows how many miles he is getting out of his tires, not in general, but out of each tire, each make, and on each vehicle, he cannot judge of tire experience. Indeed, if he has no accurate record of mileage, he cannot successfully contend for adjustments on tires.

ELECTRIC VEHICLES

PUBLISHED MONTHLY BY

ELECTRICITY MAGAZINE CORPORATION

Monadnock Building, Chicago

TELEPHONES: HARRISON 3014—AUTOMATIC 61028

New York Office, 1022 Longacre Building, 42nd Street and Broadway.

Ed. J. Mock and Paul H. Woodruff, Editors

FRED B. SCHAFER, Associate Editor.
ALLEN L. HAASE, Advertising Manager

Entered as second-class matter January 22, 1912, at the postoffice at Chicago, Illinois, under act of March 3, 1879.

TERMS OF SUBSCRIPTION

United States, Cuba and Mexico	Per year,	$1.50
Canada	Per year,	1.75
Foreign countries within the Postal Union	Per year,	2.00
Single copy		.15

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office of publication not less than ten days in advance of date of issue. Regular date of issue, the first day of each month. New advertisements will be accepted up to within five days of date of issue, but proof of such advertisements can not be shown in advance of publication.

NOTICE TO SUBSCRIBERS

REMITTANCES—Remittances should be made by check, New York draft or money order, in favor of ELECTRIC VEHICLES. Foreign subscriptions may be remitted direct by International Postal Money Order.

CHANGE OF ADDRESS—The old address should be given as well as the new, and notice should be received two weeks in advance of the desired change.

This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in ELECTRIC VEHICLES *or any voice in its management or policy.*

CHICAGO, OCTOBER, 1914

TABLE OF CONTENTS.

SPEED PLUS MILEAGE.

"WHAT is this electric proposition? Does it sell on its beauty, its merits, or the sales ability of its promoters?" These are questions not uncommonly asked by the uninitiated and for which may be found, no doubt, a modicum of excuse.

Its quickly accepted attractiveness, its silence and ability to move rapidly have marked the electric as well worth considering. And these real characters unquestionably make a strong appeal to prospective purchasers. Yet in spite of its many virtues, which create so favorable an impression, we still catch a slightly disparaging tone in the comment, "Oh, it's an electric!"—not spoken in unfavorable criticism but yet suggesting doubt of its inability to do something. Just what that something consists of depends purely on the individual viewpoint of the one to be satisfied.

If we get down to facts we must admit the electric, with all its winning features, still lacks some intangible quality (for it lacks nothing tangible) that would place it in the spotlight of popularity and make people wild to own it. Nobody mortgages his home to buy an electric.

Its mileage and speed limitations are undoubtedly the reason for this condition. In the gas car these two factors have been the decisive argument in many a sale. The public has been educated to demand the national characteristic, speed and lots of it, which in itself means long mileage. The gas type fulfills these demands. And simultaneously we find it capable of filling absolutely opposite requirements—those of the many who are desirous of motoring short distances at a safe and slow speed. In other words the gas car meets the public with a proposition that appeals to one hundred per cent of the people. The comparatively slow and short ranged electric is finding its prospects among the more conservative class, a small per cent, most of whom in fact are otherwise equipped for touring and as to speed, find the city ordinance on the boulevards quite satisfactory.

But there is nothing to gain by concealing the fact that to attain the larger success manufacturers must aim to meet the demand for speed and mileage. By securing these, with the already existing advantages of economy and durability, the electric would be in a position to reach the entire public.

This is destructive criticism and anyone can make that. The fortunate being who will cause factories to work night and day filling orders is the one who can actually build a 300-mile electric. And such a time will surely come—when the propelling power has been so developed as to secure mileage equivalent to that received from the average gas car tank supply.

To bring about this development the electric vehicle manufacturer is helpless. Upon the battery it depends—and inside information has led us to believe that in spite of the publicity and "hurrah" for the electric, the battery manufacturer is ready to admit that vehicle batteries, especially for passenger cars, are a small end of his business and cannot take too much time, energy or capital in their development.

We must admit that the battery has developed—from nothing to something. Competition has demanded such development. Now we find a few of the larger interests combined and controlling the market. Development seems to have ceased; and the beautiful carriage with its handsome fixtures has attained a climax in construction and luxury. "Build us a battery," is the cry, and this is surely the answer to the problem of putting

this type of vehicle on a more equal basis with its more powerful gas car competitor.

WHAT THE CONVENTION MEANS TO YOU.

WHEN you have visited the greatest convention of electric vehicle interests ever held—and surely you are going—it should be your special effort to determine from the experience, data and statistics offered there if the industry promises a bigger business for you in the next year.

At this very convention you will meet those in the industry who are striving to place the universal adoption of electric vehicle service on the horizon of success—which means your success.

Whatever your connections are in the industry, greater development means greater profits—whether you be a garageman, dealer, agent, salesman, central station man or user. If you are inclined to be a bit pessimistic as to the future, and sometimes wonder if this, your chosen industry, offers any great opportunity, you can determine the truth at this time. For there never was a convention of this association where central station men did not debate with vehicle manufacturers until all the vital truths and the ostensible objections were frankly disclosed. And surely this information is valuable to you.

Similarly if you attend and discover you have become connected with a "live wire" proposition, you will be ready to go back to your business with the satisfaction of the man who pays to have a diamond examined before he makes the purchase. If you are a "prospect" you can conscientiously buy your wife a coupe or install trucks in your delivery system; if a garage man, you will immediately install modern charging facilities; if a central-station man, you will offer an encouraging rate to get this new load; if a dealer, you will help yourself to the profits and spread the electric throughout the land. These are the things which this convention has in store for you and which you could not buy elsewhere.

PUBLICITY.

EVER since this paper started we have been continually receiving inquiries as to where this or that electric car is made; where this or that type of charging apparatus can be obtained; whether this battery is still manufactured or that truck company has gone out of business. These are bona fide questions, asked by people who want information and evidently have been unable to find it. And strange to say, the lay element does not predominate among these interrogators. Most of them could properly claim to belong to "the trade"; for they are garagemen, dealers and repairmen.

These inquiries are prima facie evidence that, however large the appropriations that are "exhausted" each year in advertising electric cars and their accessories, such publicity is falling far short of the mark. It is not reaching the very people who, by the nature of their trade and the questions that are asked of *them* by the laity, could do most to advance the electric vehicle and make its industry a really big business.

Do the manufacturers affiliated with this business realize that there are hundreds, even thousands, of garagemen and dealers who do not know half the makes of electric vehicles now on the market? That there are hundreds more whose little information on the subject is mostly misinformation—and harmful misinformation at that? And that most of the electric vehicle accessories, such as charging outfits, special batteries, special tires, meters, etc., are absolutely unknown to them? We would not have believed it ourselves—once. The conviction has been forced upon us by these same letters of inquiry that come to our desk.

The average manufacturer who attains any success at all is a little bit conceited. He has to be—in any business. He is inclined to brand as an ignoramus the man who inquires in what city his factory and offices are located—as one who should ask "Where is Germany?" or "Is Wilson still President?" That attitude is not logical—it is egotism.

Most men are not sufficiently accustomed to putting themselves, mentally, in the other fellow's place. Suppose that some manufacturer should suddenly become interested in the subject of house-boats. Would he know, without inquiry, to whom he should write for catalogs and quotations? Even if he had once seen house-boats advertised, could he hope to remember the name and address of even one maker? Yet the house-boat manufacturer probably imagines that everybody who is interested in the subject knows him.

The dealer and garageman are somewhat better off; they probably remember the names of some electric cars and even accessories. But they cannot carry them all in their heads, and they keep no card index of them—unless they are extraordinarily provident — until *after* they become interested. So they write to us for the information. And how do they know us? They don't. We know them, because that is a publisher's business, and we send them copies of Electric Vehicles.

If electric car manufacturers and accessory manufacturers were reaching the right people with their advertising we would not get so many inquiries from "ignorant" but interested people; we repeat that. And let this be taken merely as a friendly criticism; if those manufacturers do not want to advertise their goods in Electric Vehicles, then it behooves them to take some other step to acquaint these people with their products. Whatever such "other step" may be (we do not feel called upon to suggest any) it will surely result in increased business—and so perhaps, ultimately, in a larger recognition of this paper.

TRUCKS TEACH EFFICIENCY.

THE motor truck is not a mere substitute for one, two, three or more teams of horses. It is a revolutionizer of internal methods of handling and moving merchandise, whether it be pins or pianos, brushes or bricks, lumber or lace, and the sudden motorizing of highway commerce would upset the time-honored "take-as-long-as-you-please" customs and methods of the horse vehicle delivery system.

The business public at large does not yet know how to use the new transportation tool. The power wagon has literally had to fight for its present ground inch by inch because it has had to teach its users through costly experience, that to get from it its vast working capacity horse methods must become bygones with the horse. It is therefore fortunate for both business and the motor truck industry that the world is motorizing its highway commerce comparatively slowly. This educational period is quite young, but already its influence is marked in bringing about internal efficiency in merchandise moving practices of business establishments, so that they may approximate the efficiency of the new outside moving agency.

Charging Plugs and Receptacles for Garages

Serviceable Equipment, Fool-proof to Careless Operators, Fitting Any Electric

BY GEORGE CRANE

THE Increasing numbers of electrics, both commercial and passenger types, have been instrumental in causing many to pay special attention to the development of charging apparatus, and especially charging plugs and receptacles for public and private garages.

Most public and private garage men in particular, have enthusiastically entered into the standardization of some reliable plug and receptacle, efficient and substantial, capable of fitting any type electric.

The Albert and J. M. Anderson Company, Boston, Mass., has developed and is introducing to both public and private garages and electric vehicle manufacturers, a very interesting line of plugs and receptacles.

Fig. 1. Anderson Charging Receptacle, Vehicle Clamp Mounting.

Its principal aim has been to construct its plugs and receptacles so as to be thoroughly trustworthy and serviceable; simple, with a small number of parts and practically fool-proof from carelessness of operators, many entirely inexperienced in charging.

Type "N" double-pole charging receptacle, shown in Fig. 2, is made for 50 and 150 amperes, 125 volts. The receptacle itself is a seamless drawn-steel shell forming the housing for current-carrying parts, insulated and held securely in place by a non-conducting compound of great heat-resisting properties.

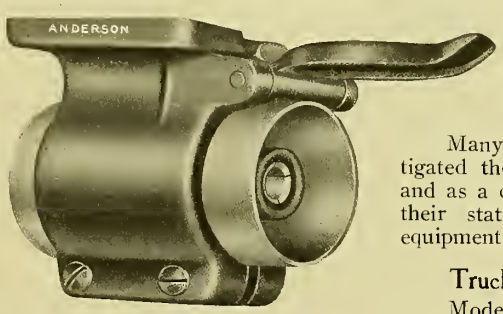


Fig. 2. Garage Receptacle with Ball and Socket Mounting.

The steel shell of the receptacle forms a supporting bearing for the plug, thereby eliminating all mechanical strain from the contact parts. Both the receptacle and plug are equipped with terminal lugs of unusual design and are attached to the contacts by means of screws. These screws permit easy detachment when making soldered connections. The charging receptacle in the illustration has an iron vehicle clamp mounting with a spring lid.

Figure 1, illustrates the Anderson ball and socket mounting for service in garages and charging stations. In this mounting the free movement of the joint permits the receptacle to align itself with the plug and attached cable; where the vehicle through any carelessness of the operator should be started before disconnecting, the plug in such a case would be pulled out on a straight line without injury.

The double-pole charging plug is shown in Fig. 3. The plug, similar to the receptacle of the same type, has a steel shell which fits closely into the cylindrical shell of the receptacle. A long supporting surface is provided, which takes all Type "N" double-pole charging mechanical strain away from the current-carrying parts. It is equipped with a special cable clamp, so that abrasion of the insulation of the cable is entirely avoided. The clamp also takes the mechanical strain from the soldered joints at the terminals.

Fig. 3. Anderson Charging Plug.

The Electric Vehicle Association of America has appointed a committee principally to investigate and after thorough verification recommend apparatus which is designed according to those specifications which this committee of engineers has found standard.

Anderson receptacles are designed in accordance with the recommendations of this association and have been adopted by a great many companies, particularly those operating large fleets of electrics and kept in privately maintained garages.

Many garage men have investigated these plugs and receptacles and as a consequence have supplied their stations with this standard equipment.

Trucks Important in War

Modern invention has revolutionized war. The explanation of the phenomenal advance of the German army in the invasion of France is found in the use of an enormous number of motor trucks to assist the troops in moving quickly. These powerful motor trucks are described as wonderfully efficient by those correspondents in the field who have watched them in action. They are used to haul big guns, and they have taken the place of horses to a large extent in the supply trains.

In former times the progress of an army was fixed, not by the ability of the men, but by the speed of the supply trains.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees, and New Announcements

AT a special meeting of the board of directors of the Electric Vehicle Association of America, held in the offices of Frank W. Smith, president, on September 30, the following business was transacted:

The minutes of the last board of directors' meeting held August 25 were approved as presented.

Membership committee, Joseph F. Becker, chairman, submitted a total of twenty applications for membership divided into the following:

MEMBERSHIP REPORT.

	Active. C. S.	Mfrs.	Associate.	Auxiliary.	Press.	Total.
August Report	101	32	698	10	30	871
Resigations			6			6
Total	101	32	692	10	30	865
Transfers						
Total	101	32	692	10	30	865
Applications	1		19			20
Pending	102	32	711	10	30	885
Total Members	134		711	10	30	885
NEW ENGLAND.						
August Report	34		76	1	1	112
Applications						
Pending	34		76	1	1	112
Total Members	34		76	1	1	112
CHICAGO.						
August Report	12		100	1	6	119
Resignation			1			1
Total	12		99	1	6	118
Applications			1			1
Pending	12		100	1	6	119
Total Members	12		100	1	6	119
PHILADELPHIA.						
August Report	4		54	1	1	60
Transfers						
Total	4		54	1	1	60
Applications			1			1
Pending	4		55	1	1	61
Total Members	4		55	1	1	61
WASHINGTON.						
August Report	1		37			38
Applications						
Pending						
Total Members	1		37			38
CINCINNATI.						
August Report	1		11			12
Applications						
Pending						
Total Members	1		11			12
SAN FRANCISCO.						
August Report			17		1	18
Applications						
Pending			17		1	18
Total Members			17		1	18
LOS ANGELES.						
August Report	2		39			41
Applications			2			2
Pending	2		41			43
Total Members	2		41			43
PITTSBURGH.						
August Report	2		26		1	29
Transfer			1			1
Total	2		27		1	30
Applications						
Pending	2		27		1	30
Total Members	2		27		1	30
NEW YORK.						
August Report	17		171	3	18	209
Resignations			5			5
Total	17		166	3	18	204
Transfer			1			1
Total	17		165	3	18	203
Applications			7			7
Pending	17		172	3	18	210
Total Members	17		172	3	18	210
DETROIT.						
August Report	5		33			38
Applications			5			5
Pending	5		38			43
Total Members	5		38			43
CLEVELAND.						
August Report	3		12			15
Applicaations			1			1
Pending	3		13			16
Total Members	3		13			16
TORONTO.						
August Report	3		12		1	16
Applications						
Pending	3		12		1	16
Total Members	3		12		1	16
DENVER.						
August Report	1		17			18
Transfer			1			1
Total	1		16			17
Applications			1			1
Pending	1		17			18
Total Members	1		17			18
ST. LOUIS.						
August Report	2		15			17
Transfers			1			1
Total	2		16			18
Applications						
Pending	2		16			18
Total Members	2		16			18
MEMBERS AT LARGE.						
August Report	42		67	4	1	114
Applications	1		1			2
Pending	43		68	4	1	116
Total Members	43		68	4	1	116

These have been secured during the past month through the co-operation of the local committee, members of section membership committees and by follow-up correspondence from the home office.

An effort was made to secure the applications from those prospects who were communicated with during the regular campaign and who evaded the matter by delaying until the fall. None has been received from this source, although several cases are pending and may be successful. A number of prospects have de-

ferred affiliating until the time of the convention. It may be remembered that over thirty-five applications were received at the time of the last convention, and it might be well for a cordial invitation to be extended to all those present at the convention, not members, to become such.

A plentiful supply of literature and application blanks will be on hand.

While the regular campaign work was concluded several months ago, we are in correspondence with a large number of people whom we hear of from time to time.

Committee on Revision of Constitution and By-laws:—F. W. Frueauff, chairman, presented a draft of the constitutional revisions, which were the subject of further discussion. These revisions were regularly presented at a meeting of the association called for this express purpose. Copies of the revisions will be mailed from the executive secretary's office to all the active members of the association, who will, according to our present constitution and by-laws, exercise their votes on same at the next regular meeting of the association, which will probably be at the time of the Philadelphia convention, October 19, 20 and 21.

New York Electrical Show:—The Electric Vehicle Association will exhibit in the New York Electrical Exposition, October 7-17, occupying space 51, where data calculated to promote the interests of electric vehicles will be exhibited. An invitation to all members of the association to make booth 51 their headquarters is heartily extended.

South American Situation: It will probably be interesting to know that the executive office now has facilities to handle the necessary translating, *et cetera*, involved in developing business in South and Central Americas, Cuba, and Mexico, and we are also prepared to supervise the preparation of Spanish and Portuguese catalogs.

Motion Picture Film Committee:—This committee has been especially active, having received a large number of requests for the use of the motion picture film, "Selling Electric Vehicles," which has been so well received when shown at several points in the country. The demand for this film has been so great that the association has purchased a second film, which will enable Mr. Andrews' committee to satisfy to a greater extent the request for the use of same. It is possible that the National Electric Light Association will also procure a film for use among their various branches.

Electric Commercial Vehicle Pamphlet:—The executive office has just issued a six-page, three-colored, inexpensive pamphlet treating with the electric commercial vehicle, which is a companion piece of literature to the one recently gotten out for the electric passenger vehicle. The commercial pamphlet is exceedingly attractive and interesting and it is felt that it will have an even greater vogue than the passenger pamphlet. The text of the commercial pamphlet follows:

EFFICIENCY.

Irresistible energy—instantly and continuously available—economically employed by the highest developed, most efficient and simplest engine known to science—the electric motor.

COSTS.

Dreaded contingencies—the costly "incidents"—reduced to a minimum; speculation gives way to the *certainty* of uniformly low operating costs. Facts and figures for the asking.

ASSURANCE.

To get there and back *on railroad schedule* (without expensive delays and injurious speeding) is the *regular dependable performance* of the electric vehicle.

CONTROL.

The easy control of the electric vehicle is prompt and positive—therefore safe. To successfully operate the electric vehicle, one does not have to be an expert mechanician—unquestioned economy results.

CHARGING.

The remarkable simplicity of the electric vehicle eliminates the necessity of "tinkering," while the charging of the powerful batteries is about as simple as "turning on" an electric lamp.

USE.

Wherever the electric vehicle has been properly installed, it has *made good*. Practically all the great "commercial fleets" are electric—the monetary investments running ino the tens of millions.

The last page is arranged to receive the imprint of the concern circularizing the pamphlet. Although the commercial pamphlet is six pages and printed in three colors, the price has been held down so that it should be very attractive to central stations and manufacturers, and others who would be in a position to use a pamphlet of this nature.

CO-OPERATIVE PRICES.

Prices of pamphlets as enclosed—folded.

Quantity.	Price per Thousand.
1,000	$10.00
2,500	9.50
5,000	9.00
7,500	8.50
10,000	7.50
25,000	6.50
50,000	5.50
100,000	4.50

Prices of pamphlets printed in **one color** (black ink) on less expensive paper—not folded.

Quantity.	Price per Thousand.
1,000	$ 7.00
2,500	6.00
5,000	5.00
7,500	4.00
10,000	3.50
25,000	3.00
50,000	2.50
100,000	2.00

To date we have received the following orders:

5,000—United Electric Light & Power Company.

Electric Passenger Vehicle Pamphlet:—It might be interesting to indicate the sale of this pamphlet to date, prices of which are the same as are indicated for the commercial pamphlets, previously referred to:

5,000—United Electric Light & Power Company
35,000—Philadelphia Electric Company
1,000—Public Service Electric Company
1,000—Buffalo Electric Vehicle Company
10,000—Toronto Electric Light & Power Company
1,000—Indianapolis Light and Heat Company
1,000—Lawrence Gas Company
3,000—Edison Illuminating Company of Brooklyn
5,000—Pacific Gas & Electric Company
5,000—Chicago Electric Motor Car Company
18,000—Utah Light & Railway Company
Total—85,000.

PHILADELPHIA CONVENTION.

A very successful meeting of the general convention committee of the Fifth Annual Convention, which will be held Monday, Tuesday, and Wednesday, October 19, 20, and 21, at the Bellevue-Stratford Hotel, Philadelphia, was held in the library of the Philadelphia Electric Company on September 23. W. H. Johnson, vice-president of the Philadelphia Electric Company, presided. There was a full representation of all

interests which are working to make the Philadelphia convention the greatest business achievement of the Electric Vehicle Association.

Entertainment:—The entertainment features of especial interest to the ladies, who are cordially invited to attend the convention, have been carefully prepared, and although it is impossible to give any details at this time, it is safe to say that all those attending the convention will find that their comfort and pleasure has been well provided for.

Exhibit:—There has been quite a demand for electric vehicle accessory exhibit coincident with the convention and the general convention committee has arranged with the Bellevue-Stratford Hotel to supply space to the manufacturers upon application, adjacent to the convention hall, so that the greatest publicity possible will be lent any exhibits which the manufacturers desire to make as individuals. Any manufacturer desiring to secure space for exhibition purposes should communicate with George B. Muth, secretary of the general convention committee, 1000 Chestnut street, Philadelphia.

Registration:—In order that due provisions can be made for delegates to the convention, it is necessary that each and every delegate register in advance of the convention, indicating whether he will be accompanied by ladies or other guests. Advance copies of the convention papers are now being prepared and it is desired that each delegate attending the convention be properly supplied with such literature and other matter. Registration should be made to the executive office of the association, 29 West 39th street, New York City.

Combining Country and City Advantages

At a time when a residence in the suburbs is regarded as bringing the ultimate in home comfort, it is worth while to do justice to the motor truck for the part it has rendered in making the outlying sections habitable. If more families are constantly making their residences at points as much as 25 miles distant from the heart of the city, it is because largely of what the motor truck has done in the way of conveying the urban convenience to their doors.

Formerly the wealthy had both city and country homes, confining their residence in the latter to the midsummer months. Now many are abandoning their city homes and making permanent residences in the suburbs. Improved methods of communication and transportation have enabled them to combine the advantages of country and city life.

The automobile has helped transit. The business man can get in and out at his whim, regardless of train schedules. His wife has her electric with which to go shopping, make calls and keep in touch with social functions. The less ornate truck deals with the practical necessity of supplying the life staples to the home.

When the trend toward the suburbs began, the usefulness of the horse, the traditional instrument of delivery, started to wane. It could not go the distances. Delivery by freight was all right when a man happened to live on a traveled line, where there were frequent trains, and his residence was reasonably near the station. But for the resident far removed from the freight station, delivery by rail became virtually impracticable. What was required was a medium that should be independent of tracks, so that sideroads could be tapped, and that should be able to cover a radius of 60 miles a day.

Only the motor truck applied successfully, and there is hardly an angle of suburban life that it does not touch.

The furniture that fits out the home comes by truck. All the material for the plumbing, the bathtub, washstands, etc., is carried this way, as are also, in many cases, the painting materials, woodwork, etc., that enter into the fitting out of the building. The same vehicles that bring the furniture in many cases also deliver carpet and rugs for the floors. This service from the motor truck continues after the family has been installed.

The commission merchant who sends butter and eggs has his trucks, for they enable him to follow his customers, and insure the delivery of the product in the best condition. The grocer is a motor truck user. So is the butcher. It is just as simple for milady to go to the telephone and place with her grocer or butcher an order for the day's dinner, as it would be for her sister in the city to do the same thing. Should she want the product of the caterer, ice cream, cakes, salads, etc., or should she desire catering for a large dinner, wedding, reception, etc., the telephone places the order, the truck does the rush delivery.

In the early morning, long before the family has separated itself from its bed, the baker has stopped his truck at the door and left the bread, bread which only a few hours before was taken from an oven 20 miles away.

The ability of the truck to go the distances and to work in all kinds of weather has removed many of the annoyances from life in the suburbs, and introduced a scientific certainty to the arrangements depending on outside service. Much of the coal is delivered by truck. More is destined to be. Electric, gas and oil companies depend on power vehicles to get their product to the consuming point. Virtually all the purchases from department stores find their way into the suburbs via trucks. Let the musical daughter of the house buy a piano or a victrola, it is promptly delivered by a motor truck.

The immense road-making devices that are being used in the campaigns to make suburban roads better are now in increasing number motor driven. This is by no means a complete list of the services being rendered by the truck to the suburbs, but it will serve to drive home the point.

Real estate values are being affected. The first consideration of a suburban home used to be contiguity to a railroad station. This no longer matters, for the truck is the method of communication. Therefore the boost in prices for places near stations no longer maintains. The truck has also opened up many beautiful points that were formerly considered inaccessible.

The telephone puts fleets of trucks at the command of the suburban resident and his family. He can start any one he needs by a moment's conversation, and it can promptly carry to his home any desired article.

It is this condition that explains why the city merchant who caters to a high-class trade feels that he can only conquer the handicap of distance delivery by power vehicles. His investment in trucks, primarily selfish, becomes a public benefaction, since it opens up for delightful home sites whole sections of charming and healthy country adjacent to the city.

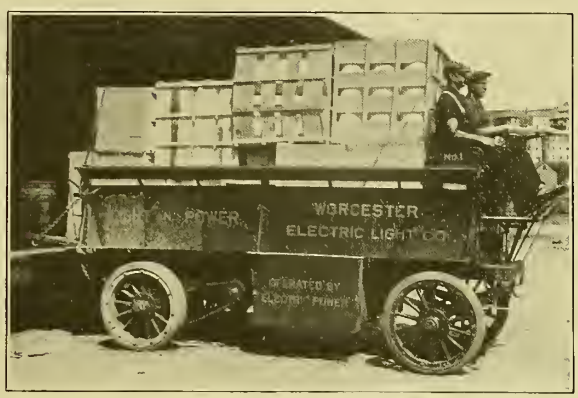
New England Central Stations Discuss Electrics

Report of Electric Vehicle Committee, New England Section N. E. L. A.

BY EDWARD S. MANSFIELD

AT the Burlington convention of the N. E. L. A., New England Section a year ago it was resolved that the chairman appoint a committee to endorse the electric vehicle to the people of New England and to devise methods of building up the load from that source. The committee was made up as follows: W. H. Atkins, W. S. Wyman, H. B. Ivers, J. Brodie Smith, Ralph D. Parker, F. H. Parker, Wilfred Smith, J. A. Hunnewell, H. T. Sands, W. H. Snow, E. S. Mansfield, A. B. Lisle, A. F. Townsend, A. J. Campbell, C. A. Paul. Mr. Atkins was made chairman and Mr. Mansfield secretary.

The committee sent to each New England central station a list of questions designed to ascertain their interest in electric vehicles and their willingness to become active in the development of the business.



Modern 2-ton G. V. for Central Station Service.

Sixty-seven companies responded: Maine, 10; New Hampshire, 5; Vermont, 9; Massachusetts, 27; Rhode Island, 3, and Connecticut, 13. Of the 67 companies 31 are using 78 passenger and 179 commercial electrics in their business, while 36 do not use any. In the territories covered by the responses 757 passenger and 341 commercial electrics are in use, aside from those in central-station service. Of the 67 companies, 19 have a department or a representative to follow up electric-vehicle business; 48 have none; 28 companies co-operate with electric-vehicle agents in selling or advertising the business. Garages or charging stations are maintained by 33 companies, and 20 companies are members of the Electric Vehicle Association of America. Reasons for lack of interest in electrics are given as follows: Impractical, no agency in town, section too hilly, no demand, not interested, town not large enough, not so good as gasoline, waiting for development, no one interested, unsatisfactory for territory.

Seventeen not already using them said they were willing to acquire at least one, 14 would not, and 6 refused to answer.

The replies showed that a few companies in New England are actively interested, appreciate the possibility or are already co-operating in the promotion of the electric. Others show half-hearted interest.

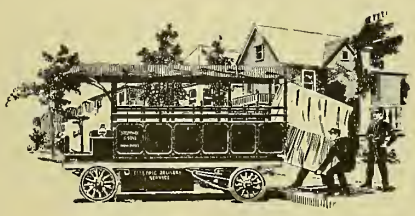
Of the 236 electrics in use by the companies, 10 use 66 per cent and one company 34 per cent of the whole number.

The committee recommends that every central station in New England study the latest developments in electric vehicles and adopt at least a friendly attitude toward their recognized economy and efficiency for transportation, which at the same time is the source of increasing revenue to the central stations, owing to the off-peak character of the charging load. Each station should own at least one such vehicle for its own use, and as an earnest of its faith in the business. Every company is recommended to join the Electric Vehicle Association of America, equip its power station with charging facilities, and have a trained attendant in charge. The committee holds that the business would be greatly facilitated by the reduction in the price of storage-battery vehicles. The project to form a co-operative company of central-station men to manufacture a low-priced electric car, however, was laid upon the table.

The committee finally pointed out that if 300 New England stations should each buy an electric or cause one to be sold to a consumer, assuming that each vehicle will consume 15 kilowatt-hours a day, the total of 2,700,000 kilowatt-hours, at 5 cents per kilowatt-hour, would represent an income of $135,000 yearly.

Frank J. Stone, of Boston, led the discussion, with an interesting compilation of statistics. He said the parcel-post service opens great possibilities for the electric vehicle, this, together with department-store delivery, which is characterized by frequent stops, giving best conditions for its use. A station can reckon yearly income at $105 to $333 per vehicle, on a three-cent rate. Mr. Stone pointed out that the motor-vehicle load differs from the power load in that the former can go anywhere to find its energy supply.

R. P. Daggett, of Boston, representing the Commercial Truck Company, discussed the report's suggestion that the initial cost of vehicles should be lower. He maintained that the cost of the motor, tires and other accessories is fixed; hence the reduction would fall on the chassis alone. The price of a two-ton chassis is about $2,800. Reckoning depreciation at 10 per cent and interest at 6 per cent (with successive reductions in principal charge, averaging 3 per cent), the maintenance cost on the chassis would be $364 per annum, or $1.16 per day. A reduction of 33 per cent in the cost price of the chassis would mean



only 40 cents per day. The cost of current for charging a vehicle of this size, together with upkeep and driver's wages, averages about $9.00 a day; hence the 33 per cent saving on chassis would represent but 4.4 per cent of the total expenditure; a matter of small significance as compared with other factors.

W. H. Bolewine, of Springfield, Mass., said the United Electric Light Company of that city now has in service 2 five-ton, 3 two-ton, 4 one-ton, and 7 1,000-pound electric trucks, which, together with garaging facilities, represents an investment of about $150,000. The company has done much to promote sales in the territory, but found a lack of co-operation by manufacturers and agents.

W. B. Kirk, of Lynn, Mass., held that the cost of electrics is excessive as compared with gasoline vehicles. A conspicuous merit of the electric is that it does not require so careful a driver as the gas car.

Louis D. Gibbs spoke cogently on the electric vehicle as the central station's opportunity. He believed manufacturers were going to keep on selling cars until central stations are compelled to give the requisite service. The electric-vehicle service is one added means by which the central station will satisfy the demands of the public.

W. H. Blood, of Boston, the first president of the Electric Vehicle Association of America, pointed out that the electric and the gas car each has its particular field. He looked forward to the day when lighting companies would awaken to their opportunity of adding to their income through off-peak charging. The engineering firm of Stone & Webster, Boston, has every district manager and most local managers of its properties in favor of electrics and using them.

F. Nelson Carle, of New York, noted that the United States was divided into various zones of interest and of efficiency as related to the electric vehicle. A promising feature is the fact that larger users of electrics are constantly adding to their fleets. The man with one car only is the one who fails to get its best efficiency. Mr. Carle pointed out the need of patient effort on the part of central stations, which, he said, could not hope to reap the full benefits upon catering to storage-battery vehicles the first year.

Day Baker, of the General Vehicle Company, Boston, said he never urged central stations to reduce their charging rates; they usually met the requirements of the situation in a liberal spirit. He named the Boston Edison Company, the Springfield, Lowell, Providence, and other companies as giving advantageous rates. Salem, Worcester, New Bedford, Hartford and Brockton all have fine garages. The Hartford Electric Light Company sells mileage; i. e., charging, care, and garaging, to owners on a mileage basis. A government report to commandants of navy yards advocated the use of electrics. The Fore River Shipbuilding Company, the American Express Company and the New Haven Railroad all have large fleets of electric trucks. The latter claims to save $20 per day per truck in freight handling. The Pureoxia Company, Boston, uses six trucks, and finds its delivery costs lower than with gas cars or horses. Other large users are the Amoskeag Company, Manchester, N. H., sugar refineries in Boston and Pacific Mills, Lawrence, Mass. The latter company's use of electrics for short hauls is very economical.

H. H. Skinner, of Providence, said that the Narragansett Electric Light Company gave one agent free charging service for his demonstration car. In the past month eight trucks have been bought by Providence concerns. One department store employs eight vehicles, the current for which the company supplies at the low price of eight mills per kilowatt-hour for off-peak charging. Mr. Skinner believed cheaper 750-pound and 1,000-pound delivery trucks would greatly promote the business.

W. M. Thayer, of Hartford, Conn., said the Hartford Electric Light Company owns batteries and rents them to truck users. In July, 1913, there were 38 such cars in operation; in January, 1914, 46; in July, 1914, 54; now there are 57. In the month of August these cars ran a total of 42,359 miles. Two trucks in express service ran 2,776 miles during the month.

D. W. Beaman, of New Bedford, Mass., described central-station practice in that city. He reckoned the income due to the average electric vehicle at $2.94 per month.

G. W. Holden, of the Edison Storage Battery Company, held that the central stations of Northern New England would do well to prepare the ground for the salesmen's visits.

Electric Floats in Wasatch Pageant

Electricity played a prominent part in the celebration of the annual carnival of the Wizard of the Wasatch in Salt Lake City, Utah, August 25 to 29, the principal feature of which was the electrical pageant which was given on the evening of the 25th and repeated again on the 28th. The 16 floats in this parade were designed by, and constructed under the supervision of Miss Emma L. Mulkey, of San Francisco, and represented themes in poetry, songs and stories. The principal ones were constructed on motor-equipped flat cars furnished by the Utah Light & Railway Company, and these, traveling under their own power along the route of the parade were unusually effective, particularly those representing boats. Over 5,000 lamps were used in producing the effects desired and these were mostly concealed in coves and the light reflected against the face of the floats, thus producing beautiful effects in lights and shades without the presence of exposed lamps.

The following were the themes of the floats: Columbia, Old King Cole, Rocked in the Cradle of the Deep, Old Heidelberg, the Old Woman Who Lived in the Shoe, Robinson Crusoe, Alice in Wonderland, Cleopatra, the Arabian Knights, the "Funnies," Madam Butterfly, Mother Goose, Hiawatha, and the Wizard of the Wasatch.

In the industrial parade on Wednesday, the Utah Light & Railway Company entered a float in the electric truck division representing Jupiter with thunderbolt in hand in the foreground and Benjamin Franklin in the background drawing lightning from the skies with his kite.

It is claimed that every nation involved in the present European trouble has at least 100 automobiles in the field and England has more than 1,000.

The warring powers have impressed for service hundreds of privately owned machines, mostly touring cars. With this great number of cars in the conflict, a most severe test for the automobile is assured.

The electric will no doubt prove its value especially because it is free from dangers of fire so disastrous to the explosives necessary to the armies.

Making Your Motor Truck Pay

Exposing Motor Delivery Mistakes and the Value of Keeping Performance Records

BY GRIDLEY ADAMS

THERE are two fundamental reasons for using motor trucks instead of horse trucks. The first reason is to cut down delivery costs.

The second reason is to do a greater amount of business and extend the selling area by extending the delivery area.

It is generally possible to make motor trucks do both of these things—always possible to make them do one—where two or more horse rigs are used.

But sometimes when horses are replaced by motor trucks, the expected advantages do not transpire. Sometimes the books show at the end of the year that motor delivery costs are actually higher instead of lower—that these costs have eaten up most of the profit from the new business the motor trucks have made possible.

Firms that have had this experience are apt to think that the fault is in the trucks. They are mistaken. The fault is in the way they use the trucks.

The experimental period in motor truck making is past. Practically every truck manufacturer to-day is turning out good, reliable and efficient vehicles. Of course it is possible for an intending user to buy trucks that are unsuited in size, or to buy too many or too few. But if the buyer takes the advice of the maker, this is not at all likely. It is to the maker's interest to provide an equipment that is in every way proper for the purpose—and experience has taught him how to do so.

In fact most motor truck manufacturers have gone a step farther. They have made it a rule in selling an outfit of motor vehicles to advise the buyer in their use—to explain how the trucks should be operated.

This is good as far as it goes, but by the very nature of things such instruction cannot go far enough.

The user of motor trucks has been told the principles of successful truck operation, but he must use his judgment in applying these principles to his own case. He must work out a definite plan or system on which his trucks can work *for him* most economically and effectually. He must strictly adhere to this system.

The system can only be devised and adhered to through a knowledge of exactly what the trucks are doing. There can be no guessing. There is no royal road to profitable motor trucking. The knowledge must be had.

Where motor trucks have been unsuccessful and over-costly it is generally because the owner operates them wholly or in part just as he has always operated his horse truck.

This is fatal. The horse has its limitations. It must have rest. It can only travel about fifteen miles a day. Left almost entirely to himself the driver will get the most possible service out of his horse or team. Frequent and long stops do no harm. They are necessary, for a horse is of flesh and blood, subject to fatigue and needful of time to recuperate.

The motor truck is a *productive machine*. It costs more than the horse and will not work as economically unless it does more work in proportion. It *can* do *vastly* more work, more quickly, and therein lies its advantage.

This ability can do no good if it is bottled up. It can do no good when fitted into the rut of the horse system.

As we tell it, how foolish it seems to buy a motor truck that has an easy capacity of fifty miles a day—and drive it only fifteen miles a day.

Yet this is done right along by people who finally regard motor trucks as failures in their business. And think of the result. A great expensive machine, carrying high investment, insurance and other burdens whether operated or not, and yet being run only a small per cent of its full capacity.

How foolish it seems to make this same great machine stand idle an hour or two, several times a day, while its load is being collected and placed ready for delivery. Yet this is done.

How wasteful to sling a few bundles or boxes—an underload—into a truck that is built to carry three or four times as much, and send it out on a long trip. This, too, is done.

And how foolish to give the machine into the hands of an inexperienced, untaught man, who neither understands the absolute necessity of keeping it on the move, nor anything about its care. He may do his level best, but repair bills will pile up and the cost per delivery will soar.

Neglect for only a few hours may easily cost hundreds of dollars in new parts, and a single accident can destroy the whole investment or incur thousands of dollars in damages collectible by others.

Yet motor trucks are sometimes entrusted to untaught or half-taught men who are then turned loose on their own responsibility.

It is conceded that a firm's former horse drivers make the best motor truck drivers. They know the business and the customers. They look on their work seriously, while regular chauffeurs would regard it flippantly and scornfully.

But these former horse drivers are accustomed to the old horse regime—slow moving and long waits. They are out of spirit with the high efficiency of motor trucks. They do not recognize the fact that the first essential of motor truck driving is the nearest possible attainment of *perpetual motion*. And they are accustomed to the care of horses rather than the care of a piece of machinery.

Without instruction it is very natural that these men should fall down on the job. No employer would take a man off one of his wagons and place him, uninstructed and untrained, in charge of the engine room, with its big Corliss, its pumps, its boilers and other power equipment. No employer would expect this man to make good on a lathe or any other machine tool. Such a thing would be ridiculous.

It is just as ridiculous to turn such a man loose on a motor truck without first giving him a thorough education in its use and care. Yet because motor truck practice is new—not old and well worked out

like engine room and machine tool practice—this very thing is sometimes done.

It is too often thought that motor trucks *themselves* will lower delivery costs and bring new business. It is too seldom realized that these things can only come through motor trucks correctly operated—through motor trucks plus a serious, persistent use of gray matter.

That is usually the root of the trouble where trouble is found.

A two-horse team pulling 3-ton loads should not be worked more than 15 miles a day. Experience has proved this, as well as the necessity of a third horse to alternate with the others in order to keep all in condition to do the work day after day.

Figuring everything in, a 3-ton electric truck can

(THIS FORM TO BE SENT IN PROMPTLY AT EACH CLOSING DATE)

ELECTRIC MOTOR TRUCK REPORT

No. 211

Kind of Battery 21 TH Gould 5 WEEKS PERIOD ENDING Aug 1 1913

Parking House New York Make of Truck B.V. Factory No 163-2

Driver Chas Ramp Capacity 3½ Tons Date of Purchase June 20/10

		WEEKS PERIOD	WEEKS TOTAL OPERATION
1	Number of days operated	30	
2	" hours "	109 15	
3	" pounds hauled	348 000	
4	Mileage	804	
5	Number of loads	55	
6	Average number of pounds per load	6327	
7	" " miles per load	14.6	
8	Cost per mile for electricity	.011	
	EXPENSES		
9	Interest, 6% on $ 1772.05	10 20	
10	Depreciation Truck (See instructions)	29 30	
11	Depreciation Battery (See instructions)	8 00	
12	Depreciation Tires (See instructions)	38 65	
13	Fire Insurance, cost per year		
14	Liability Insurance, cost per year	7 50	
15	Labor (Driver and Helper)	95 00	
16	Extra Help		
17	Garage Expense	13 85	
18	Electric Power 852 KWH at .01 per KWH	8 52	
19	Distilled Water Gal at per gal		
20	Acids " at "		
21	Lubricating Oil 1/4 " at 32 "	08	
22	Grease 3 Lbs. at 09 per lb	25	
23	Minor Repairs to Tires		
24	Estimated Repairs (Except battery and tires)	43 27	
25	Macellaneous, License, Tolls, etc.	10 31	
	TOTAL EXPENSE	259 33	
26	Average cost per cwt.	.024	
27	" " Ton Mile	.103 .0018	
28	Actual Repair Expense for Period $ 23.27 itemized on the back		
29	" Battery Renewals " $ 24.87 " " "		
30	" Tire Renewals " $ " " "		

IMPORTANT:—Be sure to carry out your figures into the TOTAL OPERATION column. Your *total* average cost per day and your *total* average cost per cwt are as important as your period figures

CONDITIONS during the period were as follows

APPROVED Mgr. CASHIER

Itemized list of all parts going on truck for the period and price of same

Electric Truck Report by Sulzberger & Sons.

be owned and operated 38 miles a day for about $8.55 a day—22.5 cents a mile.

Two two-horse teams with their reserve horses would cost approximately $14.38 a day—again 48 cents a mile when making 15 miles a day apiece.

On the 38 mile basis the truck is 17 cents a mile cheaper than horses.

By operating this truck only 15 miles a day, 5 cents a mile is lost compared to horse delivery, and 22 cents a mile is lost compared to what the truck can do at 30 miles a day.

This loss amounts to 75 cents a day—$225 a year compared to horse delivery, and $6.60 a day—$1,980 a year compared to the possible motor truck record.

Tires for this truck cost $445 a set. They are guaranteed for 8,000 miles. So the guaranteed cost of these tires is .0556 cents a mile.

They wear out and are replaced. The truck has only traveled 5,000 miles on these tires—but the owner does not know this. He only knows that they gave him fairly good service. He could get an adjustment or credit of 3,000 miles on his new set, but he does not do it. He loses this 3,000 miles at .0556 cents a mile—he loses $166.80.

Often a truck is not sufficiently supplied with oil, the motor is ruined. Because of improper handling, gears are stripped. Because of careless driving, the motor truck skids and suffers a broken wheel in addition to a general racking that sends it to the repair shop.

The truck is overloaded. It is a good truck and will stand this for awhile. But gradually things go wrong. At the garage, when the truck is carefully examined, it is found that new parts are needed to replace those that have been weakened by the strains for which they were not built.

The driver speeds up. He severely injures or kills a pedestrian, or he rams another truck or street car. Result—damage suit, beside which repair bills are insignificant.

All these things may easily happen to the motor truck that is not painstakingly driven under intelligent direction. But let us consider only the three daily losses on which we have given definite figures.

We find that under-driving loses $225 a year compared to horses, or $1,980 *a year* compared to what the truck *can* do at 30 miles a day.

We find that carelessness regarding tire service loses $167 in about a year.

These figures, of course, are taken as examples. Others might run higher or lower, but these are possible—even probable—and are not high when compared with known cases of waste.

And they total a loss for *one truck* of $437 a year compared to horse service—or $2,192 a year compared to what the truck could do properly operated; a perfectly easy loss of $2,192 a year on one truck alone—all because it is not handled properly. A loss that amounts to $10,960 a year on a small fleet of five motor trucks. There are many such fleets.

Surely $2,192 loss a year per truck is worth taking the trouble to correct.

A trouble that is to be corrected must first be analyzed. Through this analysis the *cause* of the trouble can be found, studied and eliminated.

Unfortunately, the motor truck problem cannot be studied out once for all installations. Each motor delivery service presents its own difficulties, and these must be met differently in each case.

But there is a *basis* for analysis, study and correction that exists in *all* cases.

The basis is *mileage*.

You will notice that all the losses and profits we have spoken of so far are in terms of miles. In fact, everything the motor truck is, does and uses must be measured in miles. There is no other unit of measurement that can be used.

Aggregate costs are easily accessible, including investment, interest, garaging, driver's wage, upkeep, maintenance, etc. It must be found how much work is being

done for this cost. The work is *mile* work—nothing else.

The first step, then, is to equip each truck with a device that records the miles traveled.

This device must be unfailing; it must be absolutely accurate; it must be sturdy enough to stand up under rough usage; it must be easily accessible for the purpose of constant observation; it must have its answer always summed up and ready.

Having installed such an odometer, the owner is ready to take all observations and data necessary to lay bare the faults of his motor delivery system, eliminate them, work out a new, practical, profitable system, see that it is adhered to and keep tab on it by day, week, month and year.

For the working out of an efficient system is only the beginning. It is only by watching the trucks constantly under this system that efficiency may be maintained, costs kept at the lowest mark and occasional improvements made.

Like every other implement of powerful influence, the motor truck is not a thing to be let run wild at any stage of its use. It must be closely observed and carefully, intelligently directed throughout its life—just as any other department of a factory or business is directed.

If a motor truck is started in operation for the purpose of reducing delivery costs, then it should be *made* to do so. Otherwise, it is a failure. If operated for the purpose of building new business—reaching into new fields—it must nevertheless be controlled and properly operated. If this is not done, high costs will eat up a good share, or all, of the profits derived from this new business.

The odometer installed on each truck—the trucks themselves ready for business—it is time to go to work on the drivers.

These men should be impressed with the idea that they are working on what is practically a new job. They should be told to forget all they learned about driving a team. Then they should be fully instructed in the care and use of the truck.

The manufacturer or agent from whom the motor trucks were purchased will gladly assist in this work of education. The success of his product is at stake. It is to his interest to see that his trucks are intelligently cared for and driven.

If the fleet numbers five trucks or over, it will pay to hire a motor truck expert and put him in charge, and this should by all means be done. He will carry on the work of practical instruction and keep the machines in working order. He will cost a fair salary—and is worth it.

The owner of fewer than five trucks should keep in constant touch with the service depot maintained by the manufacturer. This service is charged for—but is expert. It pays and is necessary.

Remember: there is no side-stepping this cost of expert, specialized care and attention. It is one of the essentials of profitable motor delivery practice, and pays its way many times over. It may easily mean a difference of five years in the life of a truck and save hundreds of dollars in repair bills.

Never underload a truck. It costs practically as much to carry a one-ton load in a three-ton truck as it does to load the truck to capacity. This cost charged against one ton is obviously much higher per ton than when spread out over three tons.

Never overload a truck. It may stand the abnormal strain for a while, but not for long. Overloading is bound to be expensive in the end.

Arrange so that the truck never has to wait for its load, and so that the load is placed as rapidly as possible as soon as the truck has backed up to the platform.

Some use an overhead loader or crane. This is good when the load comes in units that can be thus lifted—especially when the units are heavy. Some use detachable bodies, having two of these for each truck and loading one while the truck is out with the other. Some back under a hopper or bin for loads such as coal, and receive through a chute. Some, perforce, load by hand.

Ask the truck maker about this. Here is a point on which he can give you the best individual advice. But always remember that *the goods must be ready to load when the truck is ready to receive them,* and that the loading must be swift. That time in which a truck stands idle measures money thrown away.

(THIS REPORT MUST BE SENT IN PROMPTLY AT EACH CLOSING DATE)

GASOLINE MOTOR TRUCK REPORT

224 5 WEEKS PERIOD ENDING Aug 1 1913

Packing House / Branch House: New York — Make of Truck: Mack — Factory No.: 828

Driver: J Miller — Capacity: 4 Tons — Date of Purchase: May 24/11

		WEEK'S PERIOD	TOTAL OPERATION
1	Number of days operated	26	
2	" hours "	131 45	
3	" pounds hauled	260100	
4	Mileage	1344	
5	Number of loads	97	
6	Average number of pounds per load	7029	
7	" " miles per trip	36.	
8	" " " per gallon gasoline	3.9	
	EXPENSES		
9	Interest, 6% on $ 2113.49	17 15	
10	Depreciation (See instructions)	67 70	(.....)
11	Tire Depreciation (See instructions)	44 06	
12	Minor Repairs to Tires, etc.		
13	Fire Insurance, cost per year		
14	Liability Insurance, cost per year	7 68	
15	Labor (Driver and Helper)	90 75	
16	Extra Help		
17	Garage Expense	13 85	
18	Gasoline 343 Gal. at 17 per gal.	58 31	
19	Lubricating Oil 60½ " at 34 "	20 16	
20	Grease 5.5 Lbs. at 05 per lb.	2 75	
21	Alcohol and Glycerine		(.....)
22	Estimated Repairs and Yearly Overhauling	91 57	
23	Miscellaneous, Licenses, Tolls, etc.	10 91	
	TOTAL EXPENSES	419 71	
24	Average cost per cwt.	.161	
25	" Ton Mile	023	0024
26	Actual Repair Expense for Period $ 91.57 Itemized on the back		
27	Tire Renewals " $ "		

IMPORTANT:—Be sure to carry out your figures into the TOTAL OPERATION column. Your *total* average cost per day and your *total* average cost per cwt. are as important as your period figures.

CONDITIONS during the period were as follows

APPROVED Mgr. CASHIER

Itemized list of all parts going on truck for this period and price of same

Gasoline Truck Report by Sulzberger & Sons.

So let us consider the trucks are in perfect working order, that arrangement has been made to keep them so, that their drivers have been educated to treat them properly and use them skillfully, and that proper loading facilities have been arranged. It is now time to tabulate and correct.

Charting the relation between motor truck costs and results looks like a good deal of a problem. In reality, it is quite simple. And the charting can be done in such a way that any information you want, concerning the truck's performance and costs, is instantly available.

Many ways of doing this have been devised. Each company will doubtless have its preference in the working out of details—and, in fact, the details, as we have said, are different in different services.

Here are the fundamentals:

Three factors determine cost. They are:

(A)—Fixed charges.
(B)—Uniform variable charges.
(C)—Maintenance and overhaul charges.

Fixed charges are made up of the following factors:

Interest on investment.
Amortization of investment (or deterioration).
Operation charges (driver's wage).
Garage charges.
Insurance (fire and liability).

The investment is, of course, the money that goes into the truck complete. Interest on this is usually charged at six per cent.

Amortization or depreciation is figured in varying amounts. Where a firm wants to write the truck off the books in five years it charges twenty per cent of the truck's cost against it each year. Sometimes this is written off in two years, charging fifty per cent of the investment each year. Occasionally it is considered that the truck will last indefinitely if broken and worn parts are replaced, and then only the cost of these is charged. The following is a correct and satisfactory method—

At the end of each year $1/n$ of the investment is written off after this formula:

$$T = 1 \quad n \times p / 100 \times C \times \frac{n+1}{2}$$

T—Average interest per year.
N—Number of years in the period of amortization.
P—Per cent.
C—Capital or investment.

The operation charge (driver's wage), garage charge and insurance are, of course, fixed and known quantities.

The fixed charges on a three-ton truck costing $4,069.72, including the first set of tires, for instance, figure something like this:

Interest at 6%	$ 130.50
Amortization at 20% (5 years) less value of tires	636.06
Driver at $3 per day—300 days	900.00
Garage charges—$25 a month	300.00
Insurance (fire and liability)	140.00
Total per year	$2,106.56
Total per day	7.02

Uniform variable charges include:

Tires.
Electricity.
Oil.
Grease, waste, etc.

Maintenance and overhaul charges include all costs of overhauling and keeping in operating condition, just as the names signify. The fixed charges can naturally be figured and entered on the chart in the first place. The uniform variable charges and the maintenance and overhaul charges must be entered from daily records handed in each day or week by the driver of each truck or the delivery superintendent.

These daily records tell the real story of performance.

They include the information given by the odometer. They tell the *mileage* for each day.

Every night on returning to the garage, the driver simply notes the reading of the odometer on his truck. The reading of the night before is subtracted from this. The result is the correct number of miles traveled

He then notes on the record the amount of gasoline or electric current used during the day, its cost, the amount of oil and its cost, the grease, waste, etc., and a complete account of any repairs, replacements and labor put into the truck during the day.

Given all charges for the day and the miles the truck has traveled, you can easily chart the cost per mile—and that is your basis.

If the cost per mile is high, then look to your mileage, your repairs, your tires, gas, oil, electricity, and other items of expense. All come down to terms of miles, and in such form can be compared. The fault shows itself at once, and you can tell the driver or superintendent exactly where adjustment and improvement must be made.

Without this knowledge of mileage the knowledge of cost would do no good. *The odometer furnishes the necessary unit of measurement.*

In order to make all this perfectly clear, we shall give a few examples, showing actual chartings of actual motor truck installations.

The two report forms reproduced are particularly interesting because they show how one large firm keeps tab on both its gasoline and its electric trucks.

Another report received, made by another company, which shows a difference in method. In this case, a record is made out for each truck every working day and these records are kept in a loose leaf binder. At the end of the month the total running expenses of each truck, for the month, are recorded in a ledger.

We could show a number of other methods of determining truck costs and results, but these reproduced here are enough to show how it is done.

With an understanding of the fundamental principles as we have explained them, keeping a comprehensive and satisfactory record is simply a matter of bookkeeping. Any competent bookkeeper can easily work out the system of charting best suited to the uses of his company.

There are many and varied methods—*but they all have their base on the record of mileage,* and it is certain that without this record no intelligent or useful results could be gained.

There are four classes of motor truck users.

First, the one who does not recognize the importance of his delivery department.

Second, the one who is basing his system on horse experience, and does not realize where his losses occur.

Third, the one who admits a loss but claims inability to correct conditions.

Fourth, the one who is alert to improve conditions and is glad to devote the necessary attention to the problem.

The owner of the fourth class is the only one who will make motor trucking as profitable for his firm as it can be made. He alone is guarding against actual money loss in an effectual way. He alone is certain of success and profit.

This is naturally the class in which you would have *your* case fall. The proper use of the odometer and complete operating records are the first and most important steps.

Is Initial Price a Hindrance to Greater Sales?

A Discussion Defending Vital Statements on the Practicability and Economy of Electrics

BY R. B. DAGGETT

REPLYING to the article "Are Electric Vehicle Men Too Confident?" published in the August issue of ELECTRIC VEHICLES and written by R. W. Hutchinson, Jr., I agree with him regarding the popularizing of the electric vehicle for passenger purposes. Undoubtedly, the electric passenger vehicle will not be used in large numbers compared with the possible users until the present purchase price has been reduced very materially.

His argument refers principally to the use of electric trucks and I would, therefore, call attention to the fact that the first cost of electric trucks furnishes little impedance to its universal adoption.

A truck as an investment must pay interest on the original investment as well as show an additional earning. Any purchaser of an automobile truck of either the gasoline or the electric type considers it as an investment, the purchase price being considerably greater than would be necessary for teams of similar capacity. If he finds that the additional investment is warranted by the earning capacity, which may be due either to reduced cost of operation or an extension of business, he will invest. If an electric truck costing more than a gasoline truck will earn an equal or greater amount, then the purchaser will give the same consideration to the electric truck that he would to the gasoline truck or other modes of transportation.

Commercial Company's Electric for Hauling Service Poles.

The answer to this might be that many prospective purchasers haven't the capital to invest. My answer to this statement is that the man in business who hasn't the funds to purchase up-to-date and economical apparatus for his business is not going to stay in business on a basis capable of meeting competition.

Let us examine the first cost of a one-thousand pound electric delivery wagon which Mr. Hutchinson states will cost about $2,000 with a lead battery. The cost will be divided about as follows:

Chassis with Body	$1,500
Tires	100
Ironclad Battery	400

The Ironclad battery has been included for the reason that with it is furnished a two-year guarantee and that it will give as good a performance as may be expected from the average battery on the market considering both its efficient construction and the satisfactory results which it generally produces.

Ten per cent depreciation on the chassis and body is well within the experience of users of electric vehicles during the last 15 years and, on account of the fact that chassis and bodies being put on the market today are much improved over those built ten or more years ago, ten per cent depreciation can be considered by all who are acquainted with electrics, to be a fair amount. Six per cent on the investment would be equivalent to three per cent per year taking into account the continually decreasing investment, therefore, the amount to be charged in the operating cost against the chassis and body would be interest and depreciation, 13 per cent, or $195.

The depreciation on the battery in accordance with the guarantee is 40 per cent. Therefore, the interest on the decreasing investment account would be 5 per cent annually or $22. The cost of rubber tires would be the same on both gasoline and electric trucks, any difference being in favor of electric trucks, and, therefore, this item may be eliminated in this discussion. The amount in the annual cost column, therefore, that is due principally to the first cost would amount to $195 plus $22 or a total of $217. The total annual cost of operating the 1000-lb. electric delivery wagon is about $1,800 including depreciation, interest, insurance, driver's wages, current, garaging, etc. Two hundred seventeen dollars is 11½ per cent of the total operating cost, a relatively small percentage.

Suppose the first cost could be reduced by 50 per cent making the first cost $1,000, which Mr. Hutchinson probably would admit to be a popular price, then we would reduce the annual cost by 5¾ per cent or in round figures 6 per cent. This amount, of course, is worth while for anybody to save but the writer submits that it is not of sufficient importance to affect the sale of electric trucks.

If the durability of the battery can be increased and its capacity for a given weight increased, these improvements will have a very large effect by increasing the field of the electric truck. But the field is very large today, and it can undoubtedly be shown

that if horses could be eliminated from the streets of large cities and replaced by electric trucks as they are constructed today, there would be a large saving in dollars and cents to the community as a whole.

However, even should the transportation on city streets by electric trucks be slightly more expensive on account of a greater initial price which manufacturers have been unable to reduce, still the electric truck is bound to prevail for the reason that it is the desirable way; and will be demanded by the public in the same manner that the electric trolley car has become the universal mode of public transportation within the city limits and is destined to become the mode of transportation for trunk lines.

Standard Electric Features

The electric pleasure vehicle industry has a number of very ardent followers and the industry is comprised of a great number of worthy manufacturers.

The Standard Car Manufacturing Company undertook to build a refined and well appointed car, fully

Standard Electric Coupe.

equipped with all the accessories that add to the pleasure, comfort and safety of the occupant, at a popular price; the fundamental underlying idea being to establish a service car and to attain the maximum service for the minimum cost.

This car, as at present developed by this company, has incorporated in it the popular equipment of revolving seats, and the company equips its cars with such accessories and refinements as extra front head lights, controller lock, odometer, eight-day clock, vanity case, and in fact everything that can in any way add to the comfort and pleasure of the occupant.

The principal characteristics of the car which are most noticeable are the operating economy and the constructional features. The determining factor as to the battery equipment, of course, is the weight of the car. The Standard electric weighs 2,900 pounds.

The coupe uses 32 cells. It is quite evident that the expense of the battery is proportionate to the number of cells and, therefore, according to the above figures the battery expense is approximately one-third that of many other types.

Tire expense is likewise proportionate to the weight of the car, inasmuch as the heavier the car the more severe is the demand on the tires and naturally the greater wear and tear. The relative weights are approximately one-third in favor of the Standard electric.

As to the constructional design, the underlying principle throughout the entire car is simplicity. The idea is that the more simple the construction the smaller the up-keep and operating cost. The car is equipped with a full floating rear axle, a double reduction gear enabling an accurate adjustment without tearing down the car in any way. The braking system is a decided feature. This manufacturer has gone to the extreme on the subject of factor safety on brakes. The previous cars, brakes were ample for all ordinary purposes. In a few cities, however, where the demand on brakes is exceptionally severe, the company uses a brake which takes these exceptional factors and strains into consideration and has adopted this unusual capacity brake as its standard equipment and has now a braking capacity per pound of car in excess of the average electric. These brakes are simple concentric cam brakes which require and need absolutely no adjustment or attention other than the changing of the pull rods on the car. The service brake is 16 inches in diameter with a two-inch face, while the emergency brake is 11 inches in diameter with a two-inch face. In using the concentric brake, this company avoids the cumbersome, bulky appearance which is necessary in using such brake faces side by side.

As the name signified, the builders of this car have standardized their methods of manufacture and build but one type of car. The fundamental design of this car as marketed today is essentially the same as the first car built by this company, with the few changes that variations of public opinion and demand have caused.

Batteries Need Degree of Care

A few weeks ago a car was brought into a local electric garage with apparently nothing wrong, but the car refused to move. The puzzling part to the owner was that he could operate the electric horn, but the car would not respond to the controller. This owner neglected to look at the voltmeter, for if he had he would have noticed that it read 80 volts when standing and as soon as the controller was pulled the dial dropped to zero. The repair man knew immediately where to look for the trouble and soon solved the problem.

He examined all the batteries and found two of them without solution. This caused an open circuit and hence the car was inoperative. This only brings out the necessity for keeping the plates covered with distilled water at all times.

In a case of this character it is best to take out the dead cells or disconnect them from the circuit temporarily, so that the car may be used.

Another common cause of the car stopping dead and refusing to respond to the controller is a burned lug. The lugs are made of metal with a lead base and should one be loose it will cause arcing when the car is operating. This arcing soon melts the lug, with the result that there is an open circuit in a short time. An ordinary wire connection will do temporarily, but a new lug should of course be substituted at the first opportunity.

The Theory of Storage Battery Operation

A Discussion on the Construction and Action of Titan Batteries

THE ability to feed electric energy into a battery and then later take it out again is the result of a reversible energy transformation.

The electric energy fed into the battery does chemical work and produces substances that have stored within them a quantity of chemical energy equivalent to the total energy charge less the losses. Then when the battery is connected to a suitable circuit, the electric pressure (e.m.f.), resulting from the chemical work done, produces a flow of electricity; the chemical energy is transformed back into electric energy and delivered to the external circuit. A storage battery may therefore be regarded as a converter of electric to chemical energy on charge and chemical to electric on discharge.

The tendency that one element has to enter into combination with another is called chemical affinity, and this chemical affinity, for such elements and compounds as are used in batteries, is a measure of the electric pressure produced.

When two or more substances that have chemical affinity for one another are mixed under conditions that permit entering into combination, heat energy or electric energy are produced, and new substances are formed with a reduced energy content. Electric energy results only when a certain class of compounds are used, such as are capable of forming electrolytes when in solution. If such substances are so arranged that they form part of a closed electric circuit, a very large proportion of the energy produced when the new substances are formed (chemical reaction) may be derived as electric energy and utilized.

As an example assume the Daniell primary battery, which consists of a zinc plate immersed in a

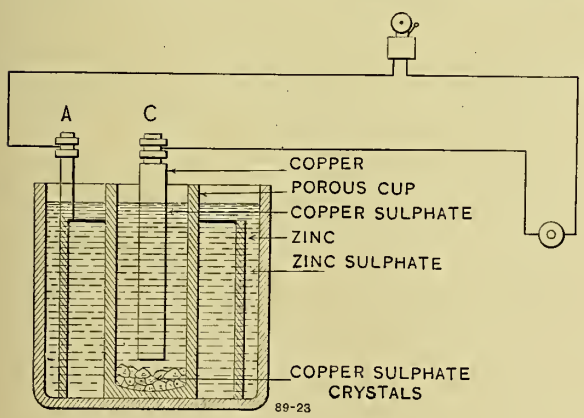


Fig. 1. Daniell Cell.

solution of zinc sulphate and a copper plate in a copper sulphate solution with a porous cup between the solutions to keep them apart.

The chemical affinity of these substances is such that the zinc has a tendency to dissolve and go into the solution and the copper has a tendency to leave it. These tendencies or affinities are represented by an electric pressure, or e.m.f., of a little over one volt. However, this pressure can do no work because there is no closed electric circuit to carry the flow of electricity.

If we connect *A* with *C* (Fig. 1) through a resistance (a bell) by pushing the button, we permit

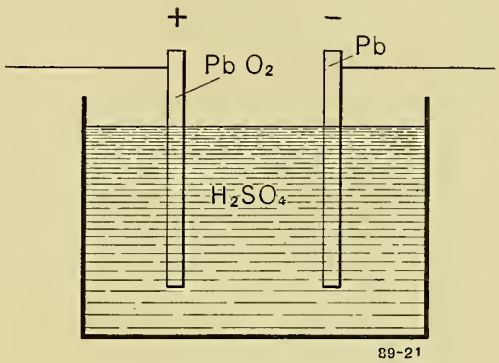


Fig. 2. Elementary Storage Battery.

the electric pressure to do work by moving electricity through the circuit, and each unit of electricity that is produced represents the transfer of a definite quantity of zinc from the zinc plate into the solution and the removal of a definite quantity of copper from the solution by depositing it upon the copper plate.

If instead of closing the circuit through a resistance we had connected the terminals of the battery to another battery, or any other source of electric energy that has an e.m.f greater than one volt, then current would be forced through this battery in the opposite direction, and the chemical affinity would be overcome and reversed; that is, zinc would leave its solution and deposit upon the zinc plate while the copper plate would go into solution.

The relation between the amount of material transferred in such reactions and the electricity produced or required is expressed by a very simple law that was discovered by Faraday and is known as Faraday's law. It is stated as follows:

"The amount of each substance which takes part in an electrochemical reaction is proportional to the quantity of electricity which passes through the circuit.

"And when various substances enter an electrochemical reaction, their amounts are proportional to their chemical equivalent weights."

By chemical equivalent weights of a material is meant that weight in grams which will be transferred per unit quantity of electricity. For instance in the case in hand each ampere hour of electricity that is taken from the battery will dissolve 1.219 grams of zinc and deposit 1.186 grams of copper.

This Daniell battery is reversible as far as the electrochemical reactions go, and therefore it might be used as a storage battery. However, because of the physical weakness of the zinc which deposits in the

form of sponge or trees, when the cell is charged, it does not make a practicable storage battery.

All electric batteries are not reversible. For instance, if we assume a battery cell made up of a zinc rod and a carbon rod immersed in dilute sulphuric acid and connected to form a part of an electric circuit, electricity will flow along the wire from the carbon rod to the zinc rod as a result of a chemical change in which zinc from the zinc rod enters the solution as zinc sulphate and free hydrogen gas is released at the carbon rod.

In conformity to Faraday's law, the quantity of electricity furnished by this cell is proportional to the amount of zinc consumed in the reaction and also to the amount of hydrogen gas released at the carbon rod.

If the current is reversed, that is, if electricity is forced through this cell in the opposite direction, the chemical reaction is not completely reversed. Zinc will be re-deposited from the solution upon the zinc rod, but oxygen will appear at the carbon rod, and in order to re-establish the cell in a condition to furnish electrical energy after the reacting chemicals have been exhausted, the substances must be renewed by substitution of new materials.

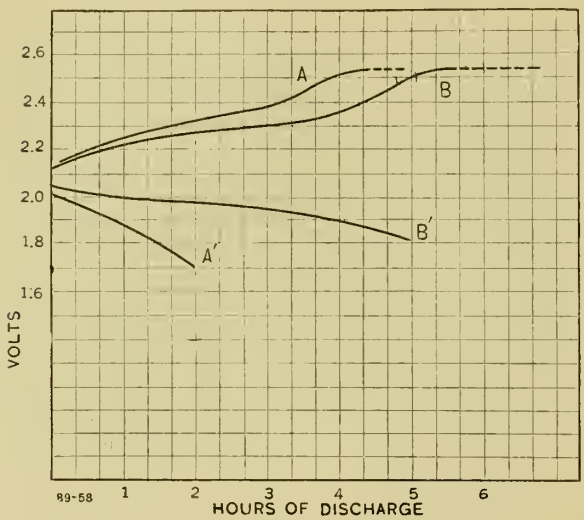


Fig. 3.

Cells which are not completely reversible as the foregoing one, or which are not practically reversible as the Daniell cell, are known as primary cells, while cells in which the electrochemical reactions are reversible to a high degree both from the theoretical and the practical standpoint, are known as storage cells.

There are only two fundamental types of storage cells in commercial use; namely, the lead cell and the nickel-iron cell. Of these two the lead cell, which consists of specially prepared lead plates immersed in a solution of dilute sulphuric acid, is probably the most frequently used, especially in pleasure electrics.

The lead storage cell is the older of the two. It was invented in 1860 by Gustav Planté, who constructed the plates by winding two thin sheets of lead with a layer of felt between them into a spiral roll. This roll was then immersed in dilute sulphuric acid and electricity sent through it, first in one direction for a certain length of time and then in the other. By this treatment the surface of the plate connected to the positive pole of the source of electric energy becomes converted into lead peroxide, while the surface of the plate connected to the negative pole is converted into porous metallic, or sponge lead. The operation of forming these materials is continued until a sufficient quantity of lead peroxide and sponge lead is formed, when the storage battery is ready for immediate use.

The action of the Planté cell is as follows: When the cell is completely discharged, the surface layers of both plates are partly converted to lead sulphate. This is reconverted into lead peroxide on the positive plate and sponge lead on the negative plate by feeding electrical energy into the cell from some external source. The lead peroxide and the sponge lead are technically known as active materials, and plates on which these active materials are produced by electrochemical action, are known as Planté plates.

This method of manufacturing lead storage battery plates was improved by Camille Faure, who in 1880 invented a method of smearing a paste of lead oxides on the surface of sheet lead which could then in a comparatively short time be converted into lead peroxide on the positive plate and sponge lead on the negative plate without the tedious forming process developed by Planté. By Faure's method, one forming charge is sufficient to produce plates ready for actual work. The practical development of Faure's invention has been to paste the lead oxides into a flat basket-like framework or grid.

Before taking up the construction of storage battery plates, we will describe, in a general way, the reactions that take place in a simple lead cell.

To begin with, let us assume a simple pasted, or Faure type, cell with just one positive and one negative plate as shown in Fig. 2. The positive plate consists of a lead alloy grid filled with a paste of active material. The negative plate also consists of a lead alloy grid, but of slightly different design, and it is also filled with a paste of active material. These plates are immersed in a dilute solution of sulphuric acid. The average electromotive force of such a lead cell is about two volts when fully charged.

When the battery is fully charged the active material of the positive plate consists principally of lead peroxide, which is deep brown in color, and that of the negative plate consists of sponge lead, which is grayish in color. The solution or electrolyte, should have a specific gravity between 1.200 and 1.300 at 70° F., according to the design of the battery; that is, it should be 1.2 to 1.3 times as heavy as pure water.

If this fully charged cell be connected into an electric circuit and allowed to discharge, the lead peroxide of the positive plate and the sponge lead of the negative will be partly transformed into lead sulphate at the expense of the sulphuric acid, and when the battery is completely discharged, the active material in both the positive and the negative plates has changed in color because of the lead sulphate, the positives being reddish brown and the negatives a darker gray. Some of the acid of the solution has entered into combination with the active materials of the plates, also water is formed.

Naturally the transfer of acid into and out of the

solution with charge and discharge is accompanied by a corresponding change in the specific gravity of the solution, and as this phenomenon follows Faraday's law, that is, the passage of a given quantity of electricity causes the transfer of a definite quantity of sulphuric acid either into or out of the solution, therefore, the specific gravity of the solution, or electrolyte, as it is technically known, furnishes an accurate measure of the quantity of electricity stored in the cell.

In just the same way the weight of either of the plates could be used to measure the quantity of electricity in the cell since a decrease in the weight of the electrolyte is always accompanied by an equal increase in the weight of the plates, and vice versa. However, the measurement of the change in weight of the plates is not practicable and therefore is of no use in following the performance of the battery.

Observing more closely the reactions here involved, we note that the lead sulphate produced by the discharge of electricity, when first formed, consists of extremely fine particles that partly encase the grains of active material.

The formation of the sulphate has been at the expense of the acid in the pores of the active material; there is not sufficient acid inside the plates to permit their complete discharge, and if new acid did not diffuse into the plate from the outside solution to replenish that used up, the reaction would cease. The rate of diffusion of acid is not very rapid, and consequently with high rates of discharge the cell shows a reduced capacity from that obtained at lower discharge rates. The conductivity of the active materials becomes reduced by the formation of lead sulphate, and when the action has proceeded to a certain extent the voltage of the cell falls off sharply, thus indicating the end of useful discharge.

The effects noted in the preceding paragraph are illustrated by the curves in Fig. 3. The upper discharge curve B^1 shows the voltage of discharge at the five-hour rate; the lower discharge curve A^1 at the two-hour rate. The upper curves A and B show the voltage on charge under the two conditions, the charge being in both instances at the same current rate as with the five-hour discharge. It will be noted that the charge requires somewhat more current than was discharged, but where the reduced capacity results from the higher discharge rate, the current input to restore the charge is also proportionately reduced.

If the battery is allowed to stand discharged or partly discharged, the fine particles of lead sulphate will become gradually transformed into a mass of larger, insoluble crystals which enter into the electrochemical reactions with difficulty, and thus reduce the capacity of the battery and in exaggerated cases, ruin it. This change of lead sulphate from a finely divided state into a crystalline mass is known as injurious sulphating.

In recharging the battery after the lead sulphate formed on the previous discharge is converted into lead peroxide on the positive plate and sponge lead on the negative plate a further passage of current decomposes the water of the electrolyte. Toward the end of charge the acid in the pores of the active materials becomes quite concentrated, this and other more obscure causes resulting in a rapid rise of voltage of the cell, which indicates completion of charge.

As soon as the voltage rises above that required to break water into its constituent parts, hydrogen will be released at the negative plate and oxygen at the positive plate. This phenomenon is called gassing, and serves as an indication of the approaching end of the charge.

The electric energy used to split water into its constituent gases is completely lost, and if gassing is allowed to proceed too vigorously, active material will be loosened from the plate and will fall as sediment to the bottom of the cell.

The gases that escape from the cell are explosive, and therefore good ventilation should be provided, and a naked flame should never be brought near the battery while charging, or immediately thereafter.

The loss of active material due to the formation of gases is called shedding. This shedding occurs very slowly with new plates whose active materials are well cemented together, but the particles become disintegrated gradually by the expansions and contractions consequent upon the charge and discharge of the battery, and when this condition exists the particles are dislodged by the gassing. The sediment thus formed falls to the space provided in the bottom of the cell to hold it and prevent it from short-circuiting the plates by bridging the space between them.

TITAN PASTED TYPE PLATES.

The Titan Storage Battery Company makes both the Planté and Faure or pasted type plates. However, the pasted type of plate is used principally, as these have by far the widest and most general field of application.

Pasted plates are made by applying a paste of lead oxides or other salts of lead to a metallic framework or grid in such a way as to cause the paste to cement into a solid mass, which can be formed by a single electrochemical operation into a finished battery plate.

The Planté, or electrochemically formed plate in practice is made from pure lead castings or sheet lead blanks, scored or ribbed to give a highly developed surface, these then being subjected to an accelerated or abbreviated electrochemical action from that previously described for a period of time sufficiently long to form the active materials.

Pasted plates for equal capacity are much lighter and considerably cheaper than the commercial heavy Planté plates. However, in constant service under favorable conditions their life measured in terms of complete cycles of discharge is less than that of Planté plates and yet on account of their other desirable characteristics, the pasted plates are almost universally employed in the construction of batteries that are to be transported. The storage battery art has so developed that Planté plate batteries have come to be used in decidedly special applications.

Titan grids are cast from an alloy of lead and antimony, the latter constituent being introduced to furnish stiffness. It is of prime importance that the material used in these grids should possess a high degree of purity and that the castings be made with extreme care and under proper conditions.

It is also of extreme importance that the physical and chemical properties of the lead oxides that form the pastes used in these plates, be carefully controlled. Impurities may produce detrimental effects that will multiply as time goes on while the physical properties have a most important bearing on the life that the plate will give in service. In the choice of these materials and their application to the plate lies the principal secret of success of this type of battery.

To obtain the most favorable results with the pasted type of plate, the active materials must have a

particular structure and a definite degree of cementation between the particles. The obtaining of these two properties in exactly the most desirable degree requires extreme skill and experience and constitutes the most important operation in the production of the plates. If the plate is not sufficiently porous, it will not allow free entrance of the acid of the electrolyte into intimate contact with the particles of active material and if it is too porous, the active material will break loose and fall to the bottom of the cell. In order to prevent this a certain degree of cementation is necessary.

Extremely hard and dense active materials have been proposed with the claim that this hardness is an evidence of maximum cementation. It is true that active materials can be made with such characteristics, but they cannot be made without a consequent severe strain on the grids of the plates. The active materials of Titan plates have the requisite porosity to absorb the natural strains produced in the active materials, which are consequent upon an increased volume due to the formation of lead sulphate which takes up more room than the materials it replaces, and also they have the proper degree of cementation to effectively bind the active materials.

It should be noted that there is no such thing as a "non-sulphating" lead storage battery. The efficiency of this battery is wholly the result of the forming of lead sulphate consequent upon the discharge of the battery. Any battery standing discharged will be subject to the recrystallization influence described above, as this is a phenomenon which is inherent in the nature of the reacting substances used in all lead batteries.

The Titan Storage Battery Company advocates the use of thin plates in batteries, which are liable to abuse through standing discharged over long periods of time, as the thinner plates are more readily recharged and brought again into good condition by a prolonged charge.

In order to meet different service conditions, plates are made in several forms and thicknesses. The thicker plates will withstand a greater number of charges and discharges before their useful life is ended. However, where high discharge rates are required within a given space and limited weight, it is advisable to increase the effective surface of the battery by using thinner plates and more of them.

New Argo Has Motor Under Hood

Chain-driven from a jackshaft placed approximately in the center of the chassis length and equipped with a battery of forty-two cells, is the 2-ton Argo truck recently brought out by the American Electric Car Company, Saginaw, Mich. It has a rated mileage per day with full load of from 40 to 60 at an average speed of 10 miles per hour. The frame is constructed of 5-inch channel sections, thoroughly braced and gussetted. The loading platform is 6 feet 8 inches wide and 11 feet 8 inches long. When empty the loading platform is 36 inches above the ground. The wheelbase is 10 feet 4 inches and the tread of both front and rear wheels 60 inches. Solid tires are used, those on the front being 36 by 4 inch singles, while those on the rear are 36 by 3 inch duals.

The motive power is an 80-volt Westinghouse motor of four pole, series-wound construction. The battery consists of fortytwo cells of 19 MV Hycap Exide type. These cells are rated at 247½ ampere-hours normal capacity. The controller is of the continuous-torque type and is operated from the steering wheel post beneath the wheel. It has four speeds forward and three speeds reverse, interlocking with a ratchet brake, the application of the latter automatically cutting off the power. It is necessary to release the ratchet brake before the power can again be applied, thus preventing application of power and brake at the same time.

The power is transmitted from the motor to the jackshaft through a special alloy steel drive tube with two universals, and from the jackshaft to the rear wheels by means of double roller chains.

The motor, controller and current consumption meters are placed beneath a sheet-steel hood forward of the dash. The battery is of the side-removal type and is carried in a battery box suspended from the frame under the driver's seat.

Skillful Drivers Often Reckless

The attention that lately has been drawn to the number of fatal accidents caused by motor vehicles has given rise to a revival of the suggestion that all drivers should be subjected to an examination testing their proficiency before being allowed to operate a motor vehicle upon the public highways. The suggestion is a natural one and theoretically desirable, and would be proper, no doubt, from the point of view of the manufacturer, who would have his car better treated.

Even if the assumption that bad driving is responsible for accidents be allowed to pass, it is not obvious that examination would provide an effective remedy. Bad driving is an expression that bears two different meanings. It may mean that the driver is unskilled in the manipulation of his car and ignorant of the road, or that while skillful in a technical sense he is careless, inconsiderate or reckless.

Examination can be of little avail in detecting bad driving of the second kind, which is after all more likely to lead to accidents than the halting efforts of the nervous beginner. While under the eye of the examining authority all candidates would be on their best behavior, observing the rules of the road with exaggerated respect.

But with the examination over and a certificate of fitness obtained, there would be nothing to prevent bad drivers of all varieties from throwing off their masks and acting according to their natures. Examination shows that the man knows the right; it can not insure that, knowing what is right, he will not do what is wrong.

Chicago Offers Garage Instruction

At the meeting of the Chicago Section of the Electric Vehicle Association of America, held at the La Salle Hotel, Tuesday evening, September 8, Prof. E. H. Freeman announced that a course of instruction for electric garage men would begin the first week in October at Armour Institute of Technology. The fee will be $10 for the entire course consisting of two-hour periods twice a week for ten weeks. The students will be thoroughly instructed in the principles underlying their practical work in charging storage batteries, repairing and maintaining the electrical equipment of the vehicles and garages.

Report of the Committee on Electric Vehicles

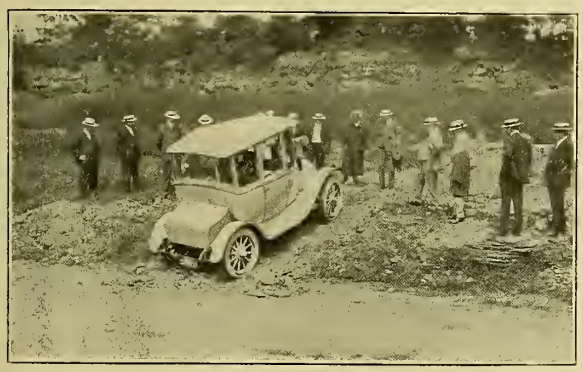
Presented at the Annual Convention of Edison Illuminating Companies

BY GEORGE H. JONES

THE 1913 report of the committee on electric vehicles laid emphasis on the necessity of accumulating data as to the operation of commercial electric vehicles in various classes of service. It is gratifying to note that the Electric Vehicle Association, in conjunction with the commercial section of the National Electric Light Association, has undertaken this work and through the medium of the "Electrical Salesman's Handbook" is giving this and similar information to the commercial men in our industry. Your committee, therefore, deems it unnecessary to follow this matter up further, but to direct its efforts to matters of general policy, looking to the wider use of electric vehicles for both passenger and commercial purposes.

The indications are that the growth of the electric vehicle load during the year has been satisfactory, but a survey of the commercial vehicle situation will show that the bulk of this business is in a comparatively few large fleets of electric vehicles. In other words, the field occupied by the small user has hardly been touched. As probably one-half of the available commercial business is of this class, it is apparent that a great deal of thought can well be given to the devising of means for securing this load. It is the opinion of your committee that the efforts of this association should be focused on the solution of this problem.

One of the essential elements involved is that of proper garaging facilities, and the absence of such is largely responsible for the slow development of this phase of the business. As one solution of the problem the adoption of a system of battery maintenance is advocated in some quarters. Under this system the vehicles would be sold without batteries, battery service being furnished by the maintenance company on the basis of a



Operating Under Obstacles.

fixed price per month, depending upon the size of the vehicle, plus a mileage charge. Progress has been made along this line, both in this country and in Europe. As your committee was informed that the committee on electric storage batteries was arranging to report on the American development, it decided to confine itself to European practice and accordingly invited E. W. Lloyd to investigate this subject in Germany while he was on the continent this summer. We are indebted to him for the information we are presenting in this report.

While it is a fact that the use of electric vehicles is not nearly as general in Europe as in the United States, yet they have very successfully specialized in certain

Recent Test Run of 1915 Buffalo Electric.

lines, viz., first, in the use of storage battery cars on steam railway lines as an adjunct to the regular service furnished by the steam locomotives; and, secondly, the use of electrically operated taxicabs.

USE OF STORAGE BATTERIES IN TAXICAB SERVICE.

The city authorities in Berlin have given a great deal of attention to the subject of street traffic with a view to avoiding congestion in the streets, and also of encouraging the use of types of vehicles the operation of which is least objectionable. As a means of accomplishing this, they have by ordinance limited the number of licenses for gas car, electric and horse-drawn vehicles. They further stipulate that if an additional gas car license is required, it is necessary that the applicant buy up ten horse cab licenses. In the case of an additional electric, it is necessary to buy up only two such licenses. It is thus seen that the electric car has decidedly the advantage.

Each chauffeur is obliged to take out a yearly license for the kind of cab driven. If a universal license is wanted it is necessary to take out four licenses, viz., horse, gas, electric and commercial.

As stated in the above, these licenses are limited in number and as they are transferable they become very valuable, the market prices being as follows: gas car, 12,000 marks; electric, 1,500 marks; horse, 750 marks.

There are about 500 or 600 electric taxicabs being operated in the city of Berlin at the present time.

These are owned by individuals and small companies operating in the neighborhood of twenty cars each. These companies have an agreement with their chauffeurs whereby the company gets 75 per cent of the gross income from the cabs. The chauffeurs get the balance, and the tips, paying, however, one-half the washing of the vehicles, which is about $.25 per day. The batteries

are owned by the Accumulatoren-Fabrik Aktiengesellschaft ("A. F. A. G."), which also owns the battery charging stations, furnishing battery maintenance on a mileage basis.

This company provides facilities for supplying taxicab owners with fresh batteries when the old ones have been exhausted. It is necessary to have approximately two sets of batteries for each taxicab. One battery station, taking care of 160 cabs, had an equipment of 300 batteries. The cost of this station, including building, ground, charging apparatus, etc., was $250,000. The batteries are kept in wooden trays on trucks.

They consist of 40 cells each having a rated capacity of 250 ampere hours at the five hour discharge rate. The life of the positive plate amounts to about 15,000 kilometers, while that of the negative plate amounts to 40,000 kilometers. The batteries are hung under the cab almost directly under the driver's seat, being placed into position by a small electric platform elevator. It requires from one and one-half minutes to two minutes to exchange batteries. The cars are housed in sheds and are generally in not over five hours per day.

A charge of twelve pf. per kilometer is made for maintenance of battery, small car repairs and electricity. This includes 180 ampere hours of electricity, which is the normal amount used at one time. If a battery requires more than this, it is sent to the shop for inspection and repairs.

Group of Buffalo Electric Officials Attending Demonstration.

The taxicabs have regular hours for coming in the garage and in this way a good load factor (about 68 per cent) is secured. One garage, having 160 taxicabs and a few other cars, was taking care of 450 batteries requiring the use of 3,000,000 kilowatt hours per year at the rate of 1.4 cents per kwh. The charging equipment in these stations is much cheaper than ours, though good. Copper busbars are used instead of cable and conduit work, and such wiring as is required is so-called "open" work, the wire being treated with acid-proof covering every six years. Energy is supplied at 6,000 volts alternating current from which direct current is obtained by the use of rotary converters. In some stations these rotaries have a capacity of 1,000 kilowatts for taking care of 700 batteries. Practically no resistance is used in charging circuits as the batteries are charged on the constant potential system. No watt hour meters are used either on the individual charging circuits or on the taxicabs. The speed of the cabs is about 32 kilometers per hour. They run about 30,000 kilometers per year, and many are eight years old. A net profit per car per year is something like 4,000 marks.

The cars average about 350 watt hours of energy per kilometer. The tariff is eighty pf. for the first 600 meters and ten pf. for each additional 300 meters. Average tariff income is forty pf. per kilometer. The wages of the garage employes is from 45 to 75 pf. per hour.

When a car comes to a battery station the meter reading is recorded on a card. Individual owners of taxicabs pay cash for each charge, or, at the most, are allowed three or four days' credit.

As noted in the above, the Germans realize the necessity of giving batteries proper care. They maintain that the success secured is due to the high class workmen they have educated. These workmen are paid a premium in wages if the battery plates show a life exceeding 10,000 kilometers.

COMMERCIAL USES OF ELECTRIC VEHICLES.

The battery maintenance system described for taxicabs is also used in other lines of commercial service. Heavy trucks and electric vehicles used in the postal service are equipped with devices which provide a rapid changing of storage batteries in a similar manner to the cab batteries.

Your committee has further detailed operating data, together with blue prints showing method of housing and supporting batteries, details of battery trucks used, etc., and will be pleased to take the matter up with those who are especially interested.

While the present financial situation does not warrant the launching at present of a project of the magnitude treated in this report, yet the whole subject can be very profitably gone into with a view of adopting, when the situation becomes normal, such parts as are applicable.

APPENDIX "A"—CONTRACT FOR GARAGE SERVICE.

A contract is hereby made between Mr..... hereinafter called the owner, and the Accumulator Mfg. Co., Louise St. No. 35, to be herein called the contractor.

(1) The contractor agrees to perform the various duties as set forth herein whenever the vehicle is turned into its assigned place at the garage at Hanover St., No. 5. Will furnish the necessary water for the washing of the vehicle and will furnish a closet for the driver's clothes and such small parts and tools as belong to the vehicle.

(2) The contractor agrees, furthermore, to charge the accumulators, that is, furnish power and such fluid as is necessary for filling the accumulator. In case the owner has two batteries, the contractor guarantees to have one always in good condition and fully charged.

In changing batteries, the driver will be rendered assistance, but he will be solely responsible for any damage done to the battery or vehicle while doing this work.

(3) The contractor agrees during the period of this contract to maintain the battery, including the wooden troughs in usable condition and in such shape that the capacity of the battery will not fall below 80 per cent of the rated capacity.

The contractor agrees to inspect the electrical equipment of the vehicle and to notify the owner of any defects. The cost of otherwise maintaining the vehicle and electrical equipment is to be borne by the owner.

The battery will be maintained only as far as ordinary use demands. Should any accident happen to the battery through collisions or higher powers, the owner will bear such expense necessary for the repair of same.

(4) Rent for the space occupied by the vehicle, as per paragraph one amounts to 25-M ($5.95) per vehicle per month and must be paid in advance on the first of every month.

The total payment, as per paragraphs 2 and 3, will amount to .11-M. per vehicle kilometer.

This last sentence assumes that the power consumption of the vehicle at maximum speed and carrying three persons (at least 225 kilograms—495 lbs.) on a good paved street will not consume more than 200 watt hours per kilometer.

The owner agrees that for the benefit of the contractor he will make test runs. If the power consumption is larger than the above as shown by this test run, the owner agrees to pay an increased rate; if the owner does not agree to this or does

not agree to a test run, this contract immediately becomes null and void.

The number of vehicle kilometers traveled will be established by the distance meter furnished by the owner and of satisfactory type to the contractor.

The driver must describe the condition of the vehicle both at the beginning and ending of each trip on a blank furnished by the contractor.

The contractor has the right to check this instrument as well as the reading of the meter.

If the meter should become defective or inoperative during a trip, the contractor must be notified of this condition. The power consumed during such a trip will be calculated by the contractor from the condition of the battery upon the return of the vehicle.

If an agreement cannot be reached by these means a distance will be assumed which will be the average of the distance traveled by the vehicle during the previous 14 days of use.

The kilometer charges (.62 miles) are to be paid daily at the office of the contractor's garage. In case of non-payment, the contractor will either not render any further service or will cancel the contract.

(6) The driver has to abide by the rules governing the yard and premises of the owner of the garage. The owner will have his driver arrested if the driver does not abide by these rules. The contractor has the right to exclude from his premises any driver that does not abide by these rules or regulations or does not behave otherwise.

(7) Higher power, fire, operation interruptions, strike, shut-out, relieve the contractor of fulfilling his contract during such a period.

The owner has to take out insurance insuring the driver against accident and the vehicle and appurtenances and the driver's property against fire, robbery or damage, since the contractor and his help will not be responsible in these lines.

(8) This contract can be cancelled on four weeks' notice.

Should the vehicle be transferred to another party during the term of this contract, this contract will be binding upon the new owner, if agreeable, to the contractor.

Should the vehicle be proved inusable, the contract will immediately become void.

(9) The cost of the Government seal for this contract will be borne by both parties equally.

APPENDIX "B"—CONTRACT FOR BATTERY SERVICE.

Contract between the Accumulator Mfg. Co., to be known as the owner herein, and the..... to be known as the renter.

(1) The owner rents to the renter..... accumulators consisting of.....elements of type.....with a guaranteed output of..... ampere hours at.....amp. discharge for the purpose of furnishing power to.....vehicles of .....system for the specific purpose of:

1. Furnishing the propelling power for vehicle No.....

2. Furnishing power at full battery voltage for the..... lamps used in illuminating vehicle No. .....and will be used for no other purpose.

The renter is furthermore required to return the battery .....within every 24 hrs. to the charging station of the owner at Hanover St., No. 5.

(2) The rent for the battery.....amounts to 25-M. ($5.95) per battery per month and must be paid in advance on the first of every month at the office of the garage of the owner.

(3) The renter agrees that the owner shall maintain the battery and charge the same if a special contract is closed to that effect.

(4) As long as the battery remains in the custody of the renter, he will prosecute anybody who should steal or injure the battery, even if this was brought about by a third party or through circumstances not in his control. In case of the disappearance or destruction of the battery, the renter guarantees to pay cash for the same. In case of any injury to the battery, the renter guarantees to pay for the repair of the same at the existing prices for such repairs.

(5) Each party to this contract has the right to cancel the same by giving four weeks' written notice. Upon the termination of this contract, the battery is to be returned to the owner at Hanover St., No. 5, and the renter will have to remove his vehicle at his own expense.

(6) The owner has the right to cancel this contract without notice if:

1. The rent, as per paragraph 2, is not paid on the day it is due.

2. The renter is in arrears for more than three days with payments for the maintenance and charging of the battery, as per paragraph 3.

3. If the renter uses the battery for other purposes than herein allowed, or otherwise breaks this contract, a return of all or part of the money as paid as rent for the current month will not be refunded.

(7) Cost of the Government seal for this contract is to be borne by the renter.

Motz Cushion Tire Traction

Every change in the angle of traction of a motor car absorbs power. Motz high efficiency cushion tires, due to their large tractional surface, do not change the angle of traction of a motor car at every paving stone. They permit a maximum amount of the force of traction to be transmitted to the pavement, thereby saving power and fuel.

The tractional surface plate shows the relative area of different types of tires in contact with the pavement. The tires shown are of equal carrying capacities. The larger tractional surface of the Motz cushion tire is due to the ingenious construction and high efficiency compound used in its manufacture.

The traction of a motor car wheel is directly proportional to the adhesive friction of the tire, with which it is equipped, upon the pavement. A tire that will permit a car to be propelled along a plane parallel to that of the pavement is most efficient.

Tires having small tractional surfaces bounce from paving stone to paving stone changing the angle of traction at every bounce.

The tractional area of the Motz cushion tire is divided into two parts; instead of the center of the tire carrying the brunt of the force of traction, as is done in the average tire, it is distributed evenly in the case of the Motz tire to the undercut sides by dual treads.

The tractional wave that forms just in front of the tractional area—the bugbear of the tire manufacturer—is broken up by the undercut sides and slantwise bridges. It never reaches the base. The result is that the fastening device does not weaken and so destroy the tire before it is worn out.

In tests that have been run, it has been shown that under ordinary street conditions these tires are the most efficient in regard to fuel consumption; thus substantiating the claims that this tire not only affords ample protection to the fine mechanical parts of the car but will actually afford a saving in fuel.

Chicago Section E. V. A. Announces New Program

The Chicago section, Electric Vehicle Association of America, will meet every Tuesday noon instead of once a month in the evening as heretofore, by order of the executive committee. There will be one meeting per month given over to special program arrangements.

Come out and renew old acquaintances at each meeting, every Tuesday, in Party Room "B," men's grill, 6th floor, Marshall Field's Annex, at 12:15 P. M.

Excellent a la carte service, as much or as little as you wish.

The special meeting for this month will be held October 27. The subject will be:

"Reports from the Electric Vehicle Convention at Philadelphia."

Testing Motors on Electric Trucks

The following described test may not offer extreme accuracy in some cases, but it is very convenient when two similar motors are available, and will probably give more accurate results for testing electric truck motors than the usual improvised Prony brake. It has been found to be a very convenient way of getting the operating characteristics of automobile motors. The possible sources of error are due to two assumptions: First, that the generated e. m. f's. are equal with equal field currents and difference of 10 to 15 per cent full load current in the armatures; second, that any two motors under test are identical and in particular, that the resistances of the armature circuits (including brushes and commutator) at any given speed are equal. It is known that the resistance of the armature circuit increases somewhat with the speed.

The two motors for test should be direct connected as shown in Fig. 1. The armature of motor (A) is then connected in series with its own field and that of motor (B), the terminals of armature (B) being connected to a water rheostat. Three voltmeters and two ammeters are connected to give the volts at terminals of armature (A), of field (A), of armature (B), and the amperes in the two armature circuits.

Then let e = volts at field terminals (A); E_0 = volts at armature terminals (A); E_1 = volts at armature terminals (B); I_0 = amperes in armature (A); I_1 = amperes in armature (B); and R = resistance of armature circuit (A) or (B) at any given speed.

The power $E_0 I_0$ absorbed by armature (A) is used as follows: (1) heating armature $A = I_0^2 R$; (2) heating armature $B = I_1^2 R$; (3) Mechanical and iron losses in (A) or (B) = M; and (4) Output from $B = E_1 I_1$.

Or, the input and output is given by

$E_0 I_0 = (I_0^2 + I_1^2) R + 2M + E_1 I_1$ — — — — (1)

Since generated emf's are assumed equal,

$E_1 + I_1 R = E_0 - I_0 R$ or $R = (E_0 - E_1) \div (I_0 + I_1)$ — — — — (2)

The output of motor (A) in K. W. is then,

$K = (E_0 I_0 - I_0^2 R - M) + 1000$ — — — — (3)

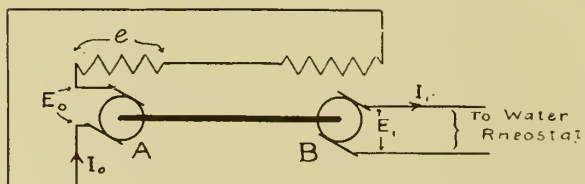


Fig. 1. Connections for Motors Under Test.

Substituting from (1) and (2) the values of M and R we obtain:

$K = (E_0 I_1 + E_1 I_0) \div 2000$

The horsepower, $HP = (E_0 I_0 + E_1 I_0) \div 1500$, and the torque in ft.-lbs. $T = 3.5 (E_0 I_1 + E_1 I_0) \div N$ where N = R. P. M.

The efficiency, $E = (1000 K) \div (E_0 + e) I_0 = (E_0 I_1 + E_1 I_0 \div 2I_0 (E_0 + e)$

The following results are from a test by this method on a 60 ampere, 60 volt motor, with fields in series:

RESULTS OF A TEST ON TRUCK MOTORS.

Applied Volts $E_0 + e$	Volts E_0	Amps. I_0	Volts E_1	Amps. I_1	R. P. M. N	Torque T	Horse Power H	Input K. W.	Effic. %
24.5	21.5	33.7	14.5	26.3	316	11.6	0.7	0.8	65.6
50	44	85	27.5	77.5	363	55.5	3.8	4.2	67.8
63	57	110	35.5	101	438	77.2	6.4	6.9	69.5
76	66	135	42.5	125	487	100.1	9.3	10.2	67.0
60	57.8	25	52	20	1150	7.5	1.6	1.5	80.0
60	53.4	57.5	46.5	51.2	640	29.5	3.6	3.4	79.4
60	51.2	95	44	90	505	60.9	5.8	5.7	76.3
60	50.4	130	35	121	420	88.7	7.1	7.8	68.3
60	48.4	155	31.5	148	370	114	8.0	9.3	64.5
60	45.0	187	23	180	298	150.5	8.3	11.2	55.5

This method can be used to obtain the electrical and mechanical losses in two similar electric trucks, by jacking up and driving one truck from the other, connecting the rear wheels with belts or rollers. All that would then be necessary would be to connect the driving motor to a source of power and the driven motor to a water rheostat.

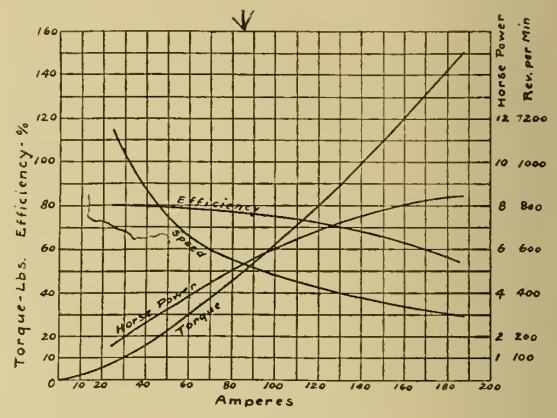


Fig. 2. Performance Data for a 60 Volt, 60 Ampere Electric Truck Motor.

Boston Motor Car Meet

The Electric Motor Car Club of Boston resumed its regular meetings with a luncheon at the City Club September 23.

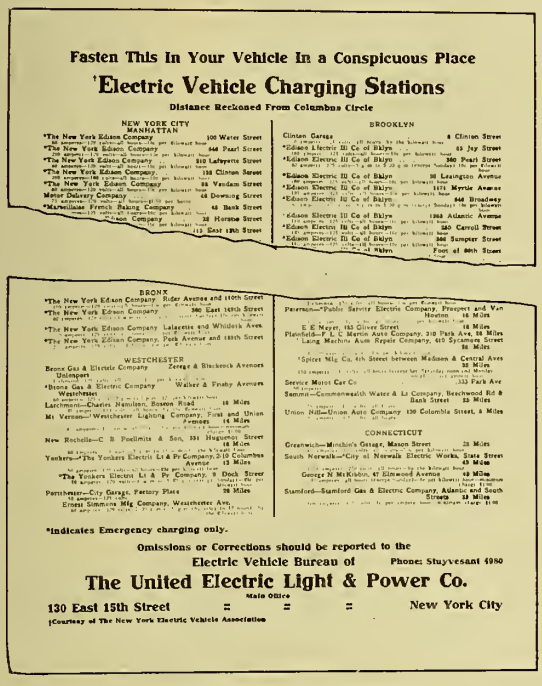
E. S. Mansfield, vice-president, was appointed chairman of the meeting which followed. Announcement was made of the plans for the convention of the Electric Vehicle Association of America, to be held in Philadelphia October 19, 20 and 21. Several of the Boston members will attend.

The secretary, C. H. Miles, reported preliminary arrangements for the Electric Vehicle Salon, to be held at the Copley-Plaza Hotel, Boston, November 2 to 6.

The affair will be conducted mainly on the lines of the salon of last Fall, but manufacturers of charging apparatus, as well as passenger-car manufacturers and agents, and storage battery manufacturers will be among the exhibitors. All the members of the Boston club will enlist their hearty support of the salon.

A nominating committee to nominate the officers for the coming year was chosen, consisting of H. F. Thomson, Morton J. Fitch, Philip E. Whiting, John Buckley and J. W. Emery. The annual meeting will be held October 14.

Do You Know That New York's Investment in Electric Vehicles Is Over $7,000,000?



Fasten This In Your Vehicle In a Conspicuous Place

Electric Vehicle Charging Stations

Distance Reckoned From Columbus Circle

NEW YORK CITY
MANHATTAN

*The New York Edison Company 100 Water Street
*The New York Edison Company 946 Pearl Street
*The New York Edison Company 310 Lafayette Street
*The New York Edison Company 136 Clinton Street
*The New York Edison Company 39 Vandam Street
Motor Delivery Company 46 Downing Street
*Marseillaise French Baking Company 48 Bank Street
Consolidated Gas Company 26 Horatio Street
*Edison Electric Ill Co of Bklyn 113 East 19th Street

BROOKLYN

Clinton Garage 8 Clinton Street
*Edison Electric Ill Co of Bklyn 63 Joy Street
*Edison Electric Ill Co of Bklyn 360 Pearl Street
*Edison Electric Ill Co of Bklyn 30 Lexington Avenue
*Edison Electric Ill Co of Bklyn 1171 Myrtle Avenue
*Edison Electric Ill Co of Bklyn 946 Broadway
*Edison Electric Ill Co of Bklyn 1368 Atlantic Avenue
*Edison Electric Ill Co of Bklyn 360 Carroll Street
*Edison Electric Ill Co of Bklyn 360 Sumpter Street
Foot of 60th Street

BRONX

*The New York Edison Company Rider Avenue and 149th Street
*The New York Edison Company 980 East 149th Street
*The New York Edison Company Lafayette and Whitlock Aves.
*The New York Edison Company Park Avenue and 180th Street

WESTCHESTER

Bronx Gas & Electric Company Zerega & Blackrock Avenues
Unionport
*Bronx Gas & Electric Company Walker & Fenby Avenues
Westchester
Larchmont—Charles Hamilton, Boston Road 16 Miles
Mt Vernon—Westchester Lighting Company, First and Union Avenues 14 Miles
New Rochelle—C S Poolmits & Son, 331 Huguenot Street 16 Miles
Yonkers—*The Yonkers Electric Lt & Pr Company, 210 Columbus Avenue 13 Miles
*The Yonkers Electric Lt & Pr Company, 9 Dock Street 16 Miles
Pernthester—City Garage, Factory Plate 26 Miles
Ernest Simmons Mfg Company, Westchester Ave.

Paterson—*Public Service Electric Company, Prospect and Van Houten 16 Miles
E E Meyer, 183 Oliver Street 16 Miles
Plainfield—F L C Martin Auto Company, 310 Park Ave, 16 Miles
Lang Machine Auto Repair Company, 415 Sycamore Street 16 Miles
*Spicer Mfg Co, 4th Street between Madison & Central Aves 30 Miles
Service Motor Car Co 333 Park Ave
Summit—Commonwealth Water & Lt Company, Beechwood Rd & Bank Street 25 Miles
Union Hill—Union Auto Company 130 Colombia Street, 8 Miles

CONNECTICUT

Greenwich—Minchin's Garage, Mason Street 28 Miles
South Norwalk—City of, Norwalk Electric Works, State Street 45 Miles
George N McKibbin, 47 Elmwood Avenue 42 Miles
Stamford—Stamford Gas & Electric Company, Atlantic and South Streets 33 Miles

*Indicates Emergency charging only.

Omissions or Corrections should be reported to the
Electric Vehicle Bureau of Phone: Stuyvesant 4980
The United Electric Light & Power Co.
Main Office
130 East 15th Street = = = New York City
[Courtesy of The New York Electric Vehicle Association

Copies of this list upon request.

There are more than 2300 Electric Vehicles in New York City.

Over 45 Electric Fleets (10 vehicles or more).

Over 100 garages and charging stations in the metropolitan district.

The cost of electricity for charging storage batteries is decreasing steadily.

(After November 1st the minimum charge will be reduced from $25.00 to $10.00 per month.)

These Items of Compelling Interest Must Appeal to You ! !

THEN WRITE TO

ELECTRIC VEHICLE BUREAU

The United Electric Light and Power Co.

GENERAL OFFICES
130 East Fifteenth Street
Phone: Stuyvesant 4980

UNITED

BRANCH OFFICE AND SHOWROOM
138 Hamilton Place
Phone: Audubon 4000

NEW GENERATING STATION
(One of the largest in the world)
West 201st Street and Ninth Avenue at the Harlem River

Linquist Automatic Safety Fender

A simple, dependable and durable safety device that automatically ***drops the Fender*** on coming in contact with any object—protecting pedestrians, you, your car and its passengers.

Adapted to Touring Cars Trucks Electrics

Endorsed by Safety First Societies throughout the country as the best protection ever afforded motorists and foot passengers. Pays for itself in the accidents and subsequent damage suits it averts.

Personal injury damage suits for amounts ranging from $100 to $15,000 have been instituted against motorists who might have avoided the courts had they simply safeguarded themselves with a LINQUIST Fender and Brake. Authorities agree that this device should be the means of saving the thousands of lives needlessly sacrificed every year.

A necessity to naturally timid drivers, to beginners, and to lady motorists. **It lends confidence.**

Works absolutely **automatically.** No foot or hand levers with which to bother. The Fender can be lowered, brakes applied and engine stopped **before** striking an object, if desired.

The LINQUIST Fender can be lowered or raised to any desired position. An excellent bumper — strong, light in weight, neat in appearance.

Extends 15 inches forward same as regular bumper bar. All parts interchangeable and adjustable to fit any make of car.

Best Insurance Obtainable Against Accidents

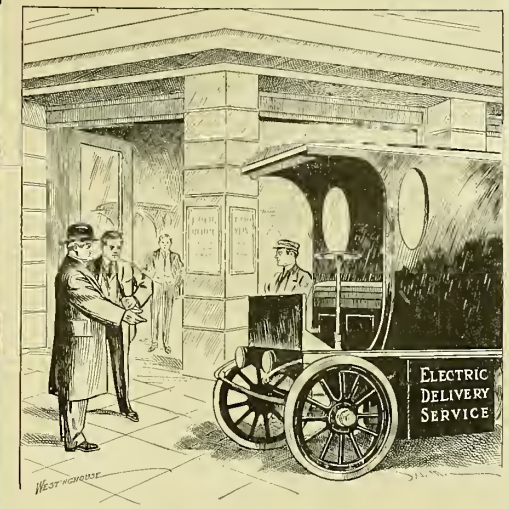
Dealers — Manufacturers — Agents!

Big field with large profits. Territorial selling rights for sale, or will consider either a partnership or royalty proposition. Big money for the first in the field. Write or wire.

WM. A. LINQUIST

(INVENTOR)

901-903 Marquette Ave. Minneapolis, Minn.



"Is the motor a *Westinghouse Electric?*"

THAT is one of the most important questions to ask when you are considering the purchase of an electric vehicle.

If the answer is "Yes," you can rest assured that you can get the highest degree of successful motor service from the vehicle—

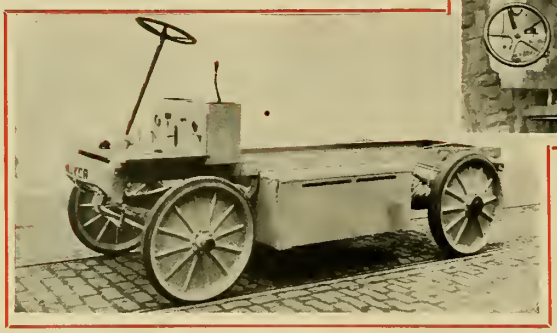
Thorough reliability.
Economical operation.
Long mileage on a single battery charge.

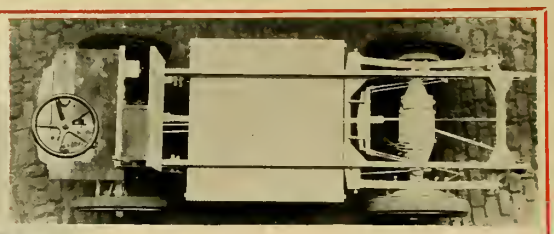
Westinghouse Electric & Mfg. Co.

East Pittsburgh, Penna.

Sales Offices in 45 American Cities

New Models of
WALKER ELECTRIC VEHICLES





This style chassis can be furnished in any capacity from 1,000 lbs. to 8,000 lbs.

WALKER VEHICLES should be investigated by every user of Commercial Vehicles. At least 75% of all city and suburban hauling and delivering can be done more economically and satisfactorily by Walker Electrics than by horse or gasoline vehicles, especially when stops are frequent.

Walker Electrics have a greater mileage capacity per day than the driver and the helper on all city work.

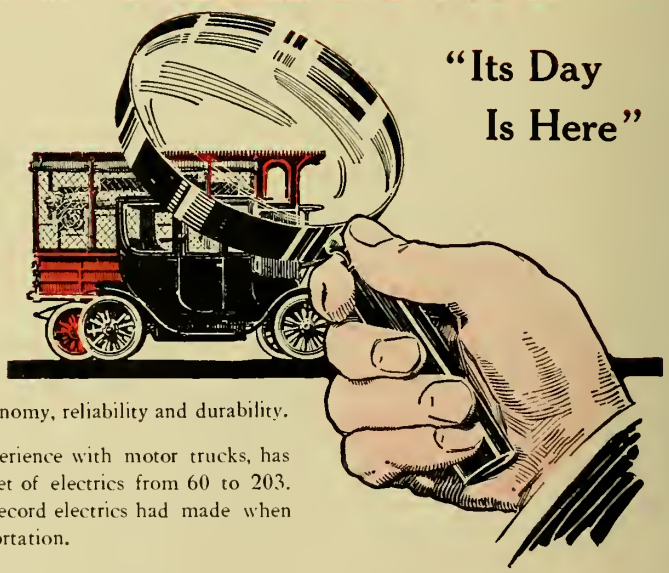
Let us know your service conditions and we will tell you frankly whether it will pay you to use Electrics.

WALKER VEHICLE COMPANY
CHICAGO

More Walker Electric Vehicles have been sold in Chicago than any other make of either Gasoline or Electric Vehicle.

398

INVESTIGATE THE ELECTRIC



"Its Day Is Here"

TWO-THIRDS of the gasoline trucks in service today will be replaced by electrics; this is the statement of a transportation expert.

The man who half investigates and buys gasoline trucks will be forced by economy or competition to change to electrics. This is expensive and unnecessary, especially in view of the record made by electrics as to economy, reliability and durability.

One large Chicago firm of fourteen years experience with motor trucks, has in the last eighteen months increased their fleet of electrics from 60 to 203. This addition was made *only* because of the record electrics had made when compared with their other methods of transportation.

Whether you own one horse and wagon or a fleet of gasoline trucks — you should investigate the electric.

Our Vehicle Engineers are at the service of Chicago firms.

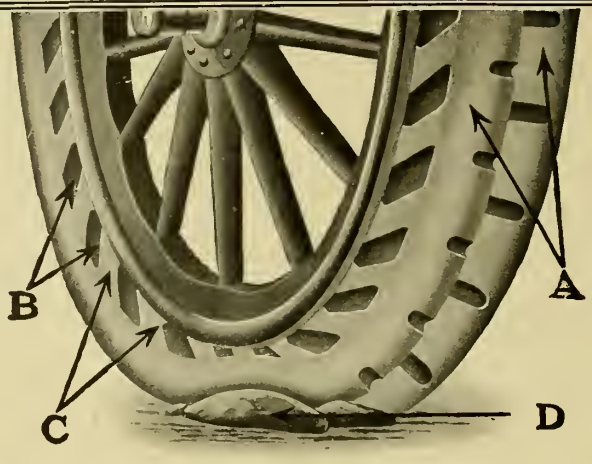
Commonwealth Edison Company
120 West Adams Street : : : Chicago

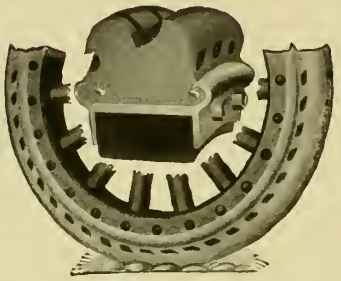
398A

ELECTRIC VEHICLES

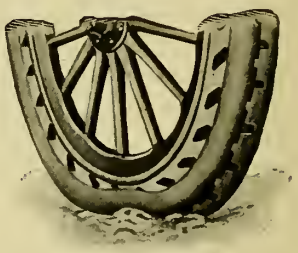
Vol. 5 CHICAGO, NOVEMBER, 1914 No. 5

AMERICAN ELECTRIC CAR COMPANY'S BORLAND ROADSTER ON A CROSS COUNTRY RUN





For Cars of Business and Pleasure



Maintained car efficiency is largely a matter of *tires*. While the tire bill itself may not seem excessive, the jolt and grind that improper tires transmit to the engine, and the car itself, frequently means a car out of commission—loss in time, money and *service*.

Motz Cushion Tires have solved the tire problem on pleasure electrics and light delivery cars. They have all the resiliency of properly inflated pneumatic tires, with none of their "pneumatic" troubles.

This resiliency is due to the dual treads (A) and the Motz undercut sides (B) and slantwise elastic bridges (C) that give and yield (D) like the air in a pneumatic tire.

MOTZ Cushion Tires

A car that is Motz equipped does not have to carry an extra set of tires. And Motz Tires are not confined simply to one or two cars. They are used everywhere on electric pleasure cars, and utility cars of all kinds—ambulances, light delivery trucks, omnibuses, etc.

The Guarantee

And Motz Tires are guaranteed for ten thousand miles when applied according to their rated carrying capacity. Many have traveled twenty thousand and even twenty-five thousand miles without trouble.

Write for Motz Book No 158 on tires. It will interest you. It is free.

Dealers

Dealers and garage men wishing to add a popular, *proven* line, should write today for the Motz selling proposition.

The Motz Tire & Rubber Co., Akron, Ohio

Branches and Distributors in 52 Cities **Dealers Everywhere**

Published Monthly By
ELECTRICITY MAGAZINE CORPORATION
Monadnock Building
CHICAGO

Entered at Chicago Post Office as Second Class Mail Matter

ELECTRIC VEHICLES

WITH WHICH IS INCORPORATED IGNITION
TRADE MARK REGISTERED IN THE UNITED STATES PATENT OFFICE

SUBSCRIPTION PRICE
Domestic - $1.50
Canada - - $1.75
Foreign - - $2.00

FOR SALE AT ALL NEWS STANDS

If Your News Dealer Will Not Supply You—Please Notify Us

Volume V | CHICAGO, NOVEMBER, 1914 | Number 5

Fifth Annual Convention of the E. V. A.

A Complete Review of Proceedings by Sessions

BY ALLEN L. HAASE

WITH a total registration of 443 members and guests, the fifth annual convention of the Electric Vehicle Association of America was held at the Bellevue-Stratford Hotel, Philadelphia, October 19, 20 and 21.

Practically fifty per cent of association members were in attendance. Since the inauguration of this association annual conventions have shown the extraordinary characteristic of transacting a great bulk of business in a very short convention period. During the three days of this meeting, seven sessions were held, three on Monday and two on each of the remaining two days.

The addresses, papers and discussions showed a marked improvement and a closer co-operation between the allied interests of the industry. Central stations and vehicle manufacturers seemed to display a better knowledge of their mutual business relations, and although a perfect co-operation was not entirely established, the results actually accomplished toward this end were exceedingly favorable.

Whereas in previous years the principal discussions seemed to arise between vehicle manufacturers and central stations as to the efforts which central stations were extending in their assistance to promote electric vehicle service, during this year's convention considerable discussion attached itself to Dr. Charles Steinmetz's prophecy, that an extremely low priced car would find an excellent field. Many of the larger pleasure car manufacturers disputed this point and vehement discussions followed.

Committee reports showed a greater standardization in all matters, the principal points of discussion being centered on the question of building a lighter car at a lower selling price.

During the opening morning session of the convention, the delegates were welcomed to the city in an address by Rudolph Blankenberg, mayor of Philadelphia. Mr. Blankenberg briefly mentioned the wonderful development of electricity in its various phases of utility and commented quite enthusiastically on the gigantic opportunities for electric vehicle service especially in Philadelphia.

Following the mayor's opening address, Frank W. Smith, president of the association delivered the following annual presidential address:

Members and Guests of the Fifth Annual Convention of the Electric Vehicle Association, Philadelphia, Pa., October 19, 20 and 21.

Again we find ourselves in convention for the purpose of considering many subjects of importance to the electric vehicle industry, and to our association.

This, the fifth annual convention, happily finds us assembled in the city of Philadelphia where the members and their guests may be assured of a cordial welcome, agreeable surroundings and splendid hospitality, and where adequate arrangements have been made for our deliberations.

This year the convention will be of three days' duration with seven sessions. To complete this lengthy program, which has been prepared with considerable care and, it is thought, along constructive lines and give the many subjects to be presented the consideration they deserve, will require our undivided attention and prompt attendance at the meetings.

The association is about to enter upon its fifth year of existence, which will, I am sure, mark the beginning of an era of energetic, active and constructive work on behalf of what is now one of the important industries of the country—the manufacture and sale of electric vehicles and their accessories for both passenger and commercial service.

Following the precedent established in the past, your president has the honor to present in somewhat brief review the

Some of the Ladies in Attendance.

events of the past year, with some comments and observations to the future.

HEADQUARTERS.

The present administration gave early consideration to the establishment and proper equipment of permanent headquarters and to the appointment of an executive secretary, together with the necessary staff with which to prosecute the affairs of the association for the benefit of its membership.

On February 1, temporary quarters were secured in the United Engineering Societies Building, New York City, and quite recently permanent rooms have been taken on the seventh floor. There members will find dignified headquarters with the necessary staff and equipment sufficient for the present needs of the association.

In February A. Jackson Marshall was appointed by your directors as executive secretary, and the present paid staff, including Mr. Marshall, numbers five.

The work carried on at headquarters and the various activities of the association throughout the past year will be reviewed and presented in detail for your consideration by the secretary.

MEETINGS.

Your directors have held meetings in New York City throughout the year, no adjournment having been had during the summer season. The meetings have been protracted and well attended.

The monthly meetings held in New York under the auspices of the national body have all had large and representative attendance. The papers have been of a high order and the discussion unusually spirited and, instructive.

Since the formation and organization of the New York section national meetings, except for convention or special purposes, have been discontinued.

Among the many subjects treated (all worthy of mention) are two that might be especially called to your attention at the January meeting. Dr. Charles Proteus Steinmetz gave an interesting and inspiring talk on the electric vehicle, and at the April meeting Fred A. Hortter, car accountant of the Boston & Maine Railroad system, presented an able paper entitled, "The Problem of Terminal Freight Congestion and its Solution." At this meeting many prominent representatives from railroad and other interests were present and a number of communications from prominent railroad officials were read indicating their interest in the electric vehicle in connection with this subject.

The time was not opportune to follow this matter to a conclusion with the railroad companies as had been planned. It is hoped that this initial presentation of the subject may be followed up by the association with a view to helping the railroads and others interested in the solving of this important question. It is unquestionably a fact that the electric vehicle if properly applied will be an important factor in this solution.

MEMBERSHIP.

At the conclusion of the Chicago convention a year ago, where splendid work was done by the local section, the total membership covering all classes numbered 479. During the past year a great amount of effort has been expended looking to the increase of this membership and to the establishment throughout the country of branches or sections in order that the work might be carried on locally in important centers. In this work the administration has sought to follow the recommendation made by President Williams in his address at Chicago in which he said:

> "It would seem that sections should be formed in every large city, possibly extending to geographic sections, corresponding with similar sections of the National Electric Light Association. It is difficult to conceive of any more effective way to carry out the educational work necessary to reach the highest attainable development in the industry."

The membership committee under whose supervision this work has been carried on, with close attention from your directors and officers, will outline in its report the manner in which the campaign has been conducted. That the work has been most successful is evident by the results. On October 1 the membership numbered 885, an increase of 85 per cent for the year, and it is hoped that before adjournment is here taken the goal set by the administration, "One thousand members with fifteen sections by the fifth annual convention," will have been reached. This membership is distributed over 35 of the 48 states of the Union, with 31 members from nine foreign countries.

SECTIONS.

From local sections representing three cities (including New York which had no local organization up to a few weeks ago) we now have sections in the following cities: Philadelphia, Boston, Chicago, Pittsburgh, Washington, Cincinnati, Los Angeles, San Francisco, Cleveland, Detroit, Toronto, St. Lous and New York, fourteen in all.

With respect to the New York section, it was thought wise to create local representation and activity similar to other cities so that New York would take care of its own local geographic section and stand in the same position as other centers of activity.

If these sections, covering as they do fourteen important centers, with additions which should be made from time to time, can be stimulated to active and constructive work, each having its own separate organization formed and conducted in accordance with the requirements of the parent body, holding monthly meetings and each having active committees at work, an "endless chain" of publicity and co-operative effort on behalf of the electric vehicle will be created which can do yeoman service for the good of the cause. Conditions and rquirements differ very materially in different centers throughout the country, and for this reason it would seem necessary that many of the details should be solved by the local interests—the central station, the manufacturer, manufacturers' agents and other interests allied in this industry. Local sections, therefore, seem the logical media through which these activities should be fostered and carried on.

This work of building up the membership has not been accomplished without consistent effort on the part of all concerned. Your president, secretary or executive secretary have personally visited many of the cities now represented by sections, where the proposition has been presented and organization effected. Much remains to be done in this direction—additional sections should be formed and proper organization maintained at headquarters to continue this growth and to see to it that active work is continued.

It cannot be said that the strength or influence of an association like ours may be properly measured by the num-

ber of members enrolled. The administration has had in mind all through the year, however, that in order to continue the work along broad and constructive lines and to assure the maintenance of the association as a real inspiration and help to electric vehicle interests a considerable growth in the membership, with the resulting increase in financial resources, is essential to permanent success. The history of kindred societies discloses few instances where within the same period the increase in membership anywhere near approaches that which has been accomplished on behalf of this association during its four years of existence.

It has been said, and properly, that the first few years of an association such as this represents the formative period; it is hoped that with the guidance of the members and with the work of those who have gone before in mind this association may start its fifth year of activity as a very real and helpful factor in the electric vehicle industry, with the means and tools ready at hand to provide valuable service to its members.

FINANCIAL.

Our financial condition will be brought to your attention in detail in the report of the treasurer. It is important that this subject should have the serious consideration of the members. The matter is one that calls for early and careful attention by the incoming administration.

It became apparent to your officers at the commencement of the fiscal year now drawing to a close that because of the increased activities of the association, the taking on of additional staff, engaging permanent headquarters, etc., that the income from dues as the membership then stood would be inadequate to carry on the desired work.

After careful consideration the proposition was submitted to the members contributing to the co-operative advertising fund, which campaign was then running for a second year, as to whether this campaign could be slightly curtailed, thereby making it possible to divert moneys to carry on the ordinary operations of the association. The consent of a large majority of the contributors to such transfer was obtained, this action approved by your directors and a sum approximating $5,000 transferred about May 1.

As the membership now stands, the annual income derived from dues is slightly in excess of $7,500. The disbursements during the past few months have amounted to about $1,000 monthly, and a tentative budget which contemplates the carrying on of section activites and other work indicates $15,000 as the amount necessary to prosecute the work for the twelve month period commencing October 1, 1914.

The expenses of this, the fifth annual convention, are not included within these figures, as the entire cost of conducting the proceedings will be taken care of by a fund raised by a special finance committee. It is hoped that this fact, together with the work of this and other local committees, will have recognition before this convention prior to final adjournment.

It is recommended that a permanent finance committee of three be appointed under whose jurisdiction, in the customary manner, the finances of the association shall be hereafter conducted.

COMMITTEES.

The activities of the several committees carrying on the work of the association in its several branches during the year will be brought to your attention in the reports which the respective chairmen will submit.

It is fitting that expression should here be given of the very great appreciation by the directors and officers of the work of the several committee chairmen and their associates who have been active throughout the year and to whom the members are greatly indebted. Reference may he made to two or three conspicuous lines of activity which will come to your attention more in detail as the convention proceeds.

Parcels Post Committee.—Under the chairmanship of James H. McGraw, in co-operation with a special committee of the National Electric Light Associaton appointed by past president, Joseph B. McCall, in the preparation and dissemination of a pamphlet, "The Electric Vehicle in Parcels Post Service for Economy and Reliability." Perhaps hut few of the members appreciate the amount of work accomplished by this committee which if continued and carried on aggressively should he productive of immense good and profit to the industry.

Committee on Operating Records.—This group's work in preparing Section 5, the electric vehicle chapter of "The Electrical Salesman's Handbook," is to be highly commended. This handbook, as most of you know, is issued by the commercial section of the National Electric Light Association, and your association had the honor through its committee of preparing this chapter, which covers more than fifty pages. Your attention is directed to this splendid piece of work by the commercial section of the N. E. L. A.

In this connection it will be apropos to quote from the report of the committee on electric vehicles submitted to the Association of Edison Illumnating Companies at its thirtieth annual convention held in West Virginia, September 15 to 17, last.

"The 1913 report of the committee on electric vehicles laid emphasis on the necessity of accumulating data as to the operation of commercial electric vehicles in various classes of service. It is gratifying to note that the Electric Vehicle Association, in conjunction with the commercial section of the National Electric Light Association, has undertaken this work and through the medium of the "Electrical Salesman's Handbook" is giving this and similar information to the commercial men in our industry. Your committee, therefore, deems it unnecessary to follow this matter up further, but to direct its efforts to matters of general policy, looking to the wider use of electric vehicles for both passenger and commercial purposes."

MOVING PICTURE FILM.

The modern moving picture is now well recognized as an important factor in educational work and the electrical interests are using this method of publicity in a number of directions.

Through the courtesy of the Edison Storage Battery Company your association has been able to produce for general exhibition a moving picture film entitled "Selling Electric Vehicles."

This important piece of advertising material was made possible without cost to the association other than the sacrifice of a considerable amount of time on the part of a large number of its representative members, the Edison Storage Battery Company generously providing all the facilities and donating the negative.

The film, which is in two reels, a total of 1,750 feet, as its title suggests, is intended as a booster for the cause. The report of the special committee will give in detail the circulation that this film has already had and outline some plans for its future use.

It became necessary to produce a second print from the negative and the expense to cover this has been authorized.

OPERATING RECORDS.

In discussions had among the directors and others as to the particular needs of our association and the industry at large, the desirability of authentic information on cost of operation of electric vehicles seemed paramount. In discussing further ways and means by which such information could be secured and made availahle to the association. McGraw, chairman of the parcels post committee, realizing the advantage which this would mean to the work which his committee has in hand, volunteered to undertake the accomplishment of this purpose and provide ways and means whereby it could be carried out.

In a paper which will be presented before the convention the nature and scope of this undertaking will be more fully described. I direct the attention of every member concerned to the importance and value of this work and earnestly solicit whatever co-operation may be necessary to carry it out expeditiously. This association can properly take credit for having initiated this important movement.

PUBLICITY AND ADVERTISING.

As the plans for the second year's co-operative advertising campaign had been completed at the time of the fourth annual convention, held in Chicago, the same committee was continued under the chairmanship of your president. It seems proper, therefore, that this subject be treated within this presentation.

The report of the committee presented at Chicago submitted in full the plan and scope of the second year's campaign and reference is made to that report for this detail.

This plan contemplated a six months' campaign. The first copy appeared about the middle of October and concluded at the end of February. The original campaign was, therefore, curtailed about a month, which represented, roughly, the cancellation of one advertisement in each of the mediums employed. The campaign was carried on through five groups of mediums—general magazines, fashion and social, central station, automobile and trade journals, etc., the original plan calling for some 130 pieces of copy.

There were some slight additions to the list of contributors as contained in the report submitted at Chicago so that

the total contributions amounted to $34,111.38 from 110 contributors, and as stated, about $5,000 was deposited to the general association funds. The ratio of contributions to the total as divided between the several classes of members remained about the same as given in the report.

It is to be regretted that a larger fund could not be raised so that a twelve months' campaign might have been undertaken. There were many factors entering into the situation which made for difficulty in the raising of a larger fund, as pointed out in the committee's report a year ago.

There were 15,000 of the booklets referred to in the report published. These have been distributed in response to inquiries and a number sold to members, principally central station companies. There remain on hand about 5,000 copies for future distribution.

It is gratifying to be able to report that the advertising copy, which was intended to be more intensive than that of the first year, met with almost universal approval on the part of the contributors and the members. It is hoped that the experience gained in the two campaigns will be of material benefit if in the future the association again undertakes work of this character.

OFFICIAL ORGAN.

Central Station, published by H. C. Cushing, Jr., has continued to serve the association as its official organ and has done much to promote the welfare of its members, having been a consistent booster for the electric vehicle. Full reports of the proceedings of the association covering the section activities have appeared in the monthly issue of the official organ, and the subscription to this publication included within the membership fee has been of great importance. Thanks are due to Mr. Cushing for his loyal support of this associaton from the date of its formation.

The question of continuing this publication as the official organ versus the publication of association transactions has been considered from time to time. In the opinion of your directors the association should eventually publish its own transactions. It has, however, been wisely determined to leave this important question to the incoming administration rather than commit the association at this time to any yearly contract, which would probably have to be done to obtain proper terms and conditions either in the matter of an official organ or the publication of transactions.

REVISION OF CONSTITUTION.

There will be presented for your consideration at this convention proposed amendments which upon becoming effective will revise the present constitution and by-laws.

With the growth of the association changes have been thought wise and the proposed amendments meet the best views of those who have given the subject careful thought. These amendments have been brought to your attention in the manner prescribed by the present by-laws. It is hoped that the necessary action to make them effective will be taken by the members at this time.

OTHER ASSOCIATIONS.

It is gratifying to report a marked increase in the consideration given to the electric vehicle by other associations and societies, nearly all of whom are treating the subject much more seriously than heretofore either by the formation of electric vehicle committees or the presentation and consideration of the subject at meetings and conventions.

The New England section of the National Electric Light Association offers a conspicuous example of co-operative effort. At its annual convention held a year ago a resolution was passed citing the progress and strength of the electric vehicle as warranting popular recognition by the New England section, and a representative committee was appointed as the result of this resolution to consider the best method of obtaining recognition from the central station interests of the great New England section of our country.

The result of this committee's work during the past year was submitted and considered at the sixth annual convention held at Narragansett Pier last month. Very strong recommendations are included in the committee's report for serious attention to the electric vehicle on the part of the central station members. Our members would do well to familiarize themselves with the details of the report.

There are many similar examples of activity among the geographic sections of the National Electric Light Association and in other directions, as covered in detail in the secretary's report.

An attempt has been made to co-operate wherever possible with these kindred societies. The officials and members of your association have prepared and in many cases personally presented papers and data with respect to the electric vehicle and have sought recognition wherever possible and desirable.

GENERAL PUBLICITY.

To anyone who keeps abreast of the times concerning the electric vehicle industry the constantly increasing volume of general publicity on behalf of the electric must be apparent.

This is not only true of the daily newspapers throughout this country and abroad, but it is especially noticeable in the several publications devoted to central station interests and in trade papers. In most of the trade papers, in which space is devoted to the electric has heretofore been somewhat limited, electric vehicle sections have been inaugurated. Increasing space is being devoted to this subject in this particular class of publication and many publishers are issuing special annual electric vehicle numbers.

The national monthly and weekly periodicals have treated the subject as never before. Purely technical publications have featured the electric in many important instances and in the popular literature of the day (fiction) reference to the electric is continually found.

This association has been a material factor in creating and fostering much of this general publicity.

SAFETY FIRST.

While the association has not undertaken any work in the "Safety First" propaganda, this is a subject which might well be considered. It is a matter of record that nearly all public utility corporations large manufacturing firms and others are addressing themselves to this subject.

In a number of instances large users of electric vehicles have adopted warning signs to be placed on the dashboards in plain sight of the driver. The following has been adopted in several cases:

SAFETY FIRST.

PEDESTRIANS HAVE RIGHT OF WAY
IN CASE OF DOUBT STOP YOUR TRUCK!
TAKE NO CHANCES OF INJURING ANYONE.

SAFETY FIRST.

If arrangements could be effected whereby vehicle accidents might be separated as between the horse drawn, the electric and other motor propelled vehicles, the electric would not suffer in comparison. Some effort might well be made by this association so that such public records as are kept of vehicle accidents in important centers would specify the type of vehicle involved in the accident.

FOREIGN TRADE.

Much has been written during the past few weeks concerning the possibility which awaits the American manufacturers in foreign countries, particularly with reference to the South American countries. This is a subject which each manufacturing member might well consider, and is one in which this Association might perhaps take an active part. Two of our leading manufacturers have already established branches in Great Britain with promise of active business.

There are many government officials and departments, as well as trade organizations, who are giving this subject attention.

The secretary of Commerce and Labor has appointed attaches who will be connected with various United States embassies and legations to devote time to this matter.

The Merchants Association of New York in recent issues of its weekly bulletin has indicated where and in what commodities opportunities for foreign trade seem to be indicated. The share of the United States in motor vehicle exports has been comparatively small.

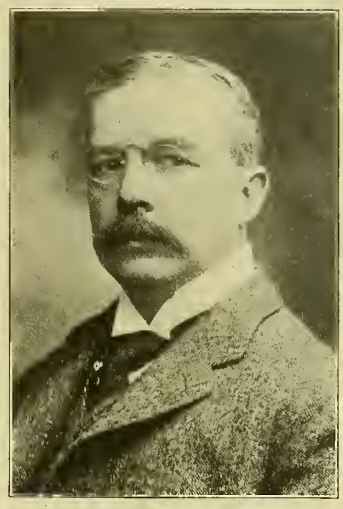
Mr. Harrington Emerson, the efficiency expert, addresses himself to this subject in the September number of the *Engineering Magazine* and an optimistic article with some interesting data is presented in the October issue of the *American Review of Reviews*.

This question presents difficulties, which, however, should not be insurmountable, and the subject is one in which this association might well interest itself.

It is recommended that the question of possible foreign trade for the electric vehicle be given consideration by the incoming administration. Perhaps a representative committee to work in conjunction with other trade associations would be the proper method to pursue. Circulars have already been addressed from headquarters to our manufacturing members on this subject and there is some material available as a working basis for a committee.

Walter H. Johnson, Vice-President.

Frank W. Smith, Retiring President.



H. M. Edwards, Treasurer.

Permit me to quote in part from a communication addressed to the publishers of *Printers' Ink,* by George B. Cortelyou, the first secretary of Commerce and Labor, former postmaster general and secretary of the treasury and now president of the Consolidated Gas Company of New York. He says:

"The immediate effect of the European war is, of course, to disarrange the industries and the finances of the entire world, but this country is in a better position than any other to take advantage of the trade opportunities that will open up as soon as the war is ended. It is reasonable to assume that the belligerant nations will be prostrated, so far as general industrial activity is concerned, as a result of the struggles they have gone through, and it is to us they will look for the means to set the wheels of commerce truning again. In the meantime, while the conflict is going on, our reserves of foodstuffs and manufacturing articles will be drawn upon by the warring nations to supply their vital needs, so that while industry in general feels the paralyzing effect of war there are special industries that benefit.

"But it is to the other neutral countries, especially those to the south of us, that we must look for the greatest opportunities of trade expansion at the present time. These, having been cut off largely from their usual source of supply, will naturally turn to us as the greatest producing nation not involved in the war, to meet the deficiency. They are looking for us quite as much as we are looking for them. With proper co-operation, our merchants and manufacturers would have little difficulty in securing much of their trade; but the real test will come when the war is over—can we hold the trade in the face of the determined competition that will be sure to come? If established on broad and solid foundations now, I believe we can. I believe that the enterprise of our people, if rightly directed and properly supported—with a fair field and no favor—can still hold its own against the world.

"So I do not think this is a time for despair, but rather for fresh efforts to push ahead into new fields as well as for the development of old ones, that we may rise to our opportunities and lay the foundations of an enduring prosperity."

ELECTRIC VEHICLE GROWTH.

It may be stated that in view of general conditions and under all the circumstances the output of electric vehicles during the past year is considered satisfactory, the industry showing a healthy growth.

It is unfortunate that authentic figures are not available indicating the exact growth throughout the country in the use of electric vehicles for passenger and commercial purposes. In the great majority of cases the registration records of the several states do not permit of the separation of the figures as between electric and other motor vehicles. In some instances the registrations are recorded only by the local officials and not under the direction of one official or state authority. This condition suggests a possible field for activity in a national way looking to some standardization of method, or at least making it possible to differentiate as between electric and other motor vehicles, so that we may have exact information as to the increases from time to time over the entire country. The secretaries of the states have already been addressed on this subject and it is apparent that a committee appointed for this purpose could reasonably hope to accomplish results.

FOREWORD.

When one turns to the consideration of the future outlook for the industry the question must be asked "What is the outlook for business generally?" It is not difficult to prophecy good business for our industry with general prosperity in sight and it is reasonable to suppose that with the return of normal business conditions the automobile industry will receive its share of the fruits of prosperity.

COMMERCIAL VEHICLE.

Certain it is that the electric will be ready to "deliver the goods" when the time comes. The adoption of the electric commercial vehicle to new fields has met with marked success during the past year. This is particularly true in the case of municipal apparatus, including electrically operated garbage collecting and sterilizing wagons, fire department equipment, etc., and the elasticity of the electric has been still further demonstrated in internal trucking and in several new fields of transportation. It has made good in the hauling of ice in the West Indies and has entered Australia and Japan, it has successfully solved the problem of moving broken wagon lot shipments in railroad yards, thus demonstrating the possibility of its replacing the switch engine in this work. Improvements are noticeable in winch equipped trucks. Further improvements in equipping and handling heavy trucks for use in hilly cities have also been made during the past year.

Important developments in worm driven vehicles for lighter classes of delivery have also been effected and the electric tractor is now used to a considerable extent. In fact, the electric commercial vehicle, using the term broadly and including all sorts of highly specialized vehicle applications, has indeed firmly established itself.

A number of manufacturers have given serious thought to the development of a moderate price delivery wagon, and one important manufacturer exhibited at the annual Electrical Show in New York, held October 7 to 17, a 750,-pound delivery wagon intended to meet the requirements of small tradesmen, such as bakers, grocers, laundrymen, etc., at $875.00. An interesting plan of garaging and caring for individual vehicles is included in the selling plan.

Other developments are to be expected in this direction.

There is unquestionably great opportunity for a large volume of commercial vehicle business in the field occupied by the small buyer. This field has not been developed to any extent and should have the attention of all concerned.

There is unquestionably great opportunity for a large volume of commercial vehicle business in the field occupied

by the small buyer. This field has not been developed to any extent and should have the attention of all concerned.

PASSENGER VEHICLE.

In the passenger field the electric is growing in popularity with the discriminating class and among the more substantial people of the country. More men are using it every day and many are finding that the electric meets most of their needs. The electric does the work with comfort and efficiency in many professional and personal fields. The statement is now very generally made that under certain conditions the electric is, as the doctor would say, "indicated." And when once this type of passenger vehicle is purchased its use is continued and this influence is bearing fruit.

A number of important developments have manifested themselves through the year in the announcement by the manufacturers of the 1915 models, these models showing improvements in many important details as to weight, comfort and convenience, mechanical and other equipment. Several manufacturers have increased their line of passenger vehicles.

Misunderstanding is apt to be created in the public mind by general statements expressed by those uninformed as to what should constitute a low price car and in consequence thereof harm may be done to the business at the present time.

There are many whose views are worthy of attention, however, who believe that there is a market for the low price electric vehicle and every effort consistent with the demand and prevailing conditions should be made by the manufacturers to cover such a field if it exists.

The passenger electric, however, is not necessarily in competition with the lower price motor vehicles of other types, and output is the controlling factor with which the manufacturer must contend. This is necessarily so because of the nature of the present popular type of electric vehicle—the enclosed coupe or brougham, with its battery, motor, controller, expensive body and necessary efficient mechanism.

The one certain solution of the problem of introducing and successfully marketing a low price electric is increased output, and if doubling or tripling the present output would produce costs which would permit of competition in the field of lower price motor vehicles there should be manufacturers both with capital and courage to seek these lower costs.

There will continue to be a market for the exclusive and luxurious passenger car in the electric as well as in other motor propelled vehicles and this field is well covered.

There has been some development through the year in a somewhat lower priced, but still well designed and well constructed car.

CURRENT RATES.

There is a continued downward trend in the rate per kilowatt hour for electric vehicle battery charging. Lower schedules of rates are reported from several sections of the country.

In New York City, for instance, the average rate over a period of about three years has decreased in the neighborhood of 25 per cent. The local central station companies in that city have announced, effective November 1, an important reduction in the minimum monthly guarantee required under the storage battery rate, namely, from $25.00 to $10.00 monthly.

This further reduction is particularly advantageous to the customer who uses but one car and should be an important factor in the case of the privately garaged passenger and small commercial vehicle.

The outbreak of war among the leading European countries in the closing days of July has had, and will no doubt continue to have its effect on our industry as in other directions. This disturbance coming, as it did, at a time when this country was gradually gaining strength in business and when the outlook was continually growing more encouraging, was indeed exceedingly unfortunate and there is evidence of depression in business due to prevailing conditions.

However, back of all this there is unquestionably being developed a large market for our product and the electric vehicle must prove out for the fundamental reason that from a purely economic standpoint the electric is new the superior of the horse in practically every class of service where properly applied.

The author wishes it were possible to present to you verbatim the splendidly encouraging expressions of opinion contained in letters received during the past few weeks from the administrative heads of many of our active and auxiliary members engaged in the manufacture or sale of electric vehicles and their accessories.

A perusal of these communications is an inspiration. They are couched in no uncertain tone and express great confidence, hope and belief for the future of the electric vehicle industry. The consensus of opinion expressed is one of optimism with a deep undertone of supreme confidence.

I predict for the electric vehicle for both the passenger and commercial field, including its many special applications, continued and increasing popularity with the purchasing public and for the industry a lasting prosperity.

The Electric Vehicle Association of America should be a contributing factor to this condition.

Following the president's address, A. Jackson Marshall, executive secretary of the association, presented a report which follows in full:

ANNUAL REPORT OF THE EXECUTIVE SECRETARY FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1914

Harvey Robinson turned the details of the general office over to the incumbent on February 1, 1914, when the office of executive secretary was created.

Since the association was first formed a tremendous amount of exceedingly valuable work has been performed, without cost, by Mr. Robinson and his associates of the New York Edison Company, and it was only when the association attempted to organize its own general office that the extent of this far-reaching co-operation was fully appreciated.

MEMBERSHIP.

No effort will be made to fully report the many interesting features attending the membership increase during the past year, as this will be covered by the report of the membership committee. Suffice to say that your membership committee has been unusually successful and their work merits unstinted praise.

On October 1, 1913, the membership of the association was as follows:

Active					
C. S.	Mfrs.	Associate	Auxiliary	Press	Total
62	35	320	8	14	439

The membership as of September 30, 1914, was as follows:

Active					
C. S.	Mfrs.	Associate	Auxiliary	Press	Total
102	32	711	10	30	885

a gain of 446 members was thus obtained during the past year. This is about 101.5 per cent increase.

A geographical distribution of the association's members is shown in the following tabulation:

MEMBERS IN THE UNITED STATES.

	Active		Asso-	Auxil-		
	C. S.	Mfrs.	ciate	iary	Press	Total
Alabama	1	..	..	..	..	1
Arizona	..	..	..	..	..	..
Arkansas	..	..	..	..	..	..
California	5	..	62	..	1	68
Colorado	2	..	17	..	..	19
Connecticut	4	..	4	..	..	8
District of Columbia	1	..	38	..	..	39
Florida	1	..	..	..	..	1
Georgia	3	..	3	..	1	7
Idaho	..	..	..	..	..	..
Illinois	6	5	103	1	5	120
Indiana	1	1	3	..	..	5
Iowa	2	..	2	..	..	4
Kansas	1	..	..	..	..	1
Kentucky	2	1	1	..	..	4
Louisiana	1	..	..	..	..	1
Maine	1	..	..	..	..	1
Maryland	1	..	3	..	1	5
Massachusetts	24	2	77	1	..	104
Michigan	2	4	42	.	..	48
Minnesota	2	..	2	..	..	4
Mississippi	1	..	..	..	..	1
Missouri	3	1	18	..	..	22
Montana	..	..	..	..	..	..
Nebraska	1	..	1	..	..	2
Nevada	..	..	..	..	..	..
New Hampshire	..	..	..	..	..	..
New Jersey	2	1	38	..	..	41
New Mexico	..	..	..	..	..	..
New York	14	8	148	4	18	192
North Carolina	..	..	..	..	..	..
North Dakota	..	..	..	..	..	..
Ohio	2	4	27	3	..	36
Oklahoma	..	..	2	..	..	2
Oregon	1	..	..	..	..	1
Pennsylvania	3	4	77	1	2	87
Rhode Island	3	..	8	..	1	12
South Carolina	..	..	..	..	..	..
South Dakota	..	..	..	..	..	..
Tennessee	1	..	3	..	..	4
Texas	1	..	2	..	..	3
Utah	..	..	..	..	..	..
Vermont	1	..	..	..	..	1

Virginia	2	..	..	..	..	2
Washington	2	..	2	..	..	4
West Virginia	..	..	1	..	..	1
Wisconsin	1	..	2	..	..	3
Wyoming	..	..	..	..	..	..
Totals	98	31	686	10	29	854

MEMBERS NOT IN THE UNITED STATES.

	Active C. S.	Active Mfrs.	Asso-ciate	Auxil-iary	Press	Total
Australia	..	..	1	..	..	1
Brazil	..	..	1	..	..	1
British Columbia	..	..	2	..	..	2
Canada	3	1	12	..	1	17
Denmark	..	..	1	..	..	1
England	..	..	6	..	..	6
Germany	..	..	1	..	..	1
New Zealand	..	..	1	..	..	1
Philippine Islands	1	..	..	..	..	1
Totals	4	1	25		1	31

SECTIONS.

Very great advances have been made in sectional development work. At the time of the fourth annual convention held last year in Chicago, the association had, in addition to its activities in New York through the general office, two sections, namely, New England and Chicago. On September 30, 1914, less than one year later, the association had fourteen sections, an increase of 600 per cent. The twelve new sections, together with their dates of formation and acceptance by the board of directors, are as indicated: Philadelphia, December 16, 1913; Washington, February 24, 1914; Cincinnati, March 24, 1914; San Francisco, April 24; Los Angeles, May 22; Pittsburgh, June 19; New York, Detroit, Cleveland, Toronto, July 15; Denver and St. Louis, August 25.

MEMBERSHIP REPORT BY SECTIONS.

	Active C. S.	Active Mfrs.	Asso-ciate	Auxil-iary	Press	Total
New England Section	30	2	76	1	1	112
Chicago Section	7	5	100	1	6	119
Philadelphia Section	1	3	55	1	1	61
Washington Section	1	..	37	..	..	38
Cincinnati Section	1	..	11	..	..	12
San Francisco Section	17	..	..	..	1	18
Los Angeles Section	2	..	41	..	..	43
Pittsburgh Section	1	1	27	..	1	30
New York Section	9	8	172	3	18	210
Detroit Section	2	3	38	..	..	43
Cleveland Section	..	3	13	..	..	16
Toronto Section	2	1	12	..	1	16
Denver Section	1	..	17	..	..	18
St. Louis Section	1	1	16	..	..	18
Members at Large	37	5	68	4	1	116
Total Members	102	32	711	10	30	885

This phase of the association's growth is of very great importance for it permits of sustained, concerted action which sooner or later gets desired results. Plans are active for further increasing sectional representation in those localities where such organizations could secure necessary support and make desired headway. The general office would be pleased to confer with any one interested in electric vehicle promotion regarding possible formation of a section in their locality.

FINANCES.

As a matter of convenience and in order to relieve the treasurer of a considerable volume of work, the details of the treasurer's office were turned over to the general office on July 1, 1914. Since that time we have developed and kept the books of the association (especially prepared for the peculiar needs of the office) and have sent out and collected all bills, and have made the necessary reports to the board of directors and the treasurer, the funds having been turned over to Treasurer Baker for deposit in a Boston bank, the treasurer's headquarters.

The treasurer has prepared a report of his office from August 1, 1913 to July 1, 1914, and the general office has prepared the treasurer's report from July 1, 1914 to September 30, 1914. These reports are shown in the treasurer's report.

ESTIMATED INCOME (MEMBERSHIP DUES) FOR THE YEAR 1914-1915.
(Based on membership as of September 30, 1914.)

Classifications	Amount
Manufacturers active $50.00	$1,660
Central station active $50.00	900
Central station active $25.00	475
Central station active $10.00	220
Central station active $5.00	210
Associate $5.00	3,560
Auxiliary $25.00	250
Press $10.00	300
Total	$7,515

Inasmuch as the expense of the association for several months past have been at the rate of upwards of $15,000 a year, and as the estimated expenses for the year 1914-15, considering our increased activities, and while practising economies, must approximate a similar figure, some provisions will have to be made to insure sufficient funds to properly operate the association. The general office is in a position to judiciously spend reasonable sums of money for the benefit of the industry, and means should be provided to permit the carrying out of necessary work.

COMMITTEES.

Some sixteen permanent and temporary committees have conducted the work of the association with rather unusual activity. A brief summary is submitted, the committee's reports carrying in detail the work accomplished.

1913 Convention Committee.—The 1913 convention—thanks to the good work of the committee—surpassed in general excellence any previous convention. The attendance of out-of-town delegates was considerably larger than that of any previous year. An excellent, well-balanced program of papers, lively discussions and a generous complement of amusement combined to make the convention an unusual success.

Committee on Constitutional Revision has prepared a revision of the constitution of the association which is being considered for use during the year 1914-15.

Committee on Membership and Formation of Sections has increased the membership in one year from 439 to 885 and through its efforts twelve important sections have been added in a similar period of time.

Committee on Operating Records.—Chief among the work of this committee has been the preparation of a table of operating costs; also the compilation of the electric vehicle section (No. 5, pages 3 to 50 inclusive) of the "National Electric Light Association's Solicitors' Handbook" distributed during the past few months.

Committee on Garage and Rates.—Somewhat recently the garage and rates committee was formed of the old garage committee and the rates and charging stations committee. The garage and rates committee has obtained an index of garage and rates conditions throughout the country; has suggested a new design for the official garage sign, and has prepared a report indicating electric vehicle charging facilities along the route of the proposed Lincoln Highway from New York to San Francisco.

Committee on Insurance has been instrumental in securing a ruling whereby many of the fire insurance companies have given a reduction of 15 per cent from standard automobile rates where electric vehicles were properly equipped with suitable fire extinguishers.

Committee on Legislation has co-operated with various interests in an effort to secure for the electric vehicle due consideration in legislative matters.

Committee on Educational Courses has under preparation electric vehicle courses which may be included in the curriculum of colleges, and which may, with modifications, be employed by vehicle manufacturers and central stations.

Committee on Standardization has been responsible for needed standardized practice, and has co-operated with the standardization committee of the Society of Automobile Engineers, which action will further assure electric vehicle recognition in the broad motor field.

Committee on Papers has had in charge the preparation of papers presented before the association during the past year, and is also responsible for the papers program of this convention.

Committee on Traffic has been working largely with the Citizen's Street Traffic Committee of New York in effecting desirable traffic regulations.

Committee on Central Station Co-operation, lately appointed, has been investigating the relations of central stations and manufacturers in the sale and use of electric vehicles with a view of promoting the interests of all concerned.

Committee on Good Roads has been obtaining an index on the road situation throughout the country, also lending any aid possible in furthering good road development.

Committee on Parcel Post Delivery has conducted a very extensive investigation of the parcel post delivery field and have waged an aggressive campaign to insure the recognition of the electric vehicle by the postal authorities and others concerned. The co-operative parcel post delivery committee of the National Electric Light Association as chairmaned by Frank W. Frueauff, has been a large and influential factor in this development.

Committee on Publicity has had charge of the very successful advertising campaign which was discontinued about February 1, the remaining funds being applied to the operating expenses of the general office.

Committee on Motion Pictures, recently appointed, is arranging for the distribution and use of the motion picture "Selling

Electric Vehicles," based on a scenario by S. G. Thompson and performed by a number of members of the association.

GENERAL.

Guide on Section Management.—A very comprehensive guide for the management of sections has been prepared by the general office.

Membership Application Form.—During the past year the membership application form has been revised and simplified.

Common and Preferred Prospects.—The general office in February effected a new plan for the handling of prospects obtained from advertising campaigns and otherwise, which are brought periodically to the attention of the manufacturers interested.

Prospects are divided first as to passenger and commercial and then each of these two principal classes are subdivided into common and preferred.

Passenger and Commercial Vehicle Pamphlets.—The general office has published two pamphlets, size 3¼ by 6¼, for resale permitting the imprint of the purchaser. One pamplet treats with the passenger and the other with the commercial electric vehicle.

Member, E. V. A. A.—During the year the suggestion of incorporating the phrase "Member, Electric Vehicle Association of America" in manufacturers' advertising and on letterheads was offered. Many companies have indicated their intention to so use the phrase.

Conditions Abroad.—There has been a great deal of activity abroad during the past year, in the promotion of electric vehicles. This development especially manifested in England, where the electric vehicle committee of the Incorporated Municipal Electric Association, representing a large number of electricity supply companies, has been organized and is conducting an aggressive campaign.

The electric vehicle committee has been especially interested in the work of our standardization committee, and has adopted our recommended practice of charging plug.

Employment Bureau.—We have endeavored to establish an employment bureau to take care of applications of employers and employees. While we have made some progress in furthering this department same has, as yet, not been fully developed, but it is felt that this department can be made a valuable feature to electric vehicle interests during the coming year.

Publicity.—The general office has been successful in establishing very friendly relations with the press generally. We have succeeded in having a large amount of interesting matter printed, which we believe is registering itself in overcoming destructive prejudice and misunderstanding. We are now issuing about twice a week interesting articles and news items to about two hundred mediums, including daily newspapers, trade, technical, and popular magazines. There still remains a great deal of work to be accomplished and it is hoped that our facilities during the coming year will be amplified to take advantage of the great moulder of public opinion—publicity.

Advertising—General.—If in the future the association undertakes a further publicity campaign of any nature, the general office will be in a good position to successfully conduct same.

N. E. L. A. Convention.—Extraordinary interest was aroused in Philadelphia at the time of the National Electric Light Association convention, held on June 2, 1914. Dr. Charles P. Steinmetz was, to a large measure, responsible for the tremendous amount of valuable publicity obtained in the press on account of his address on "The Electric Vehicle." Dr. Steinmetz's address was not only the subject of extensive publicity in Philadelphia, but the press generally throughout the country. Trade and technical journals also featured his remarks.

Thomas A. Edison, who was also in attendance at the garding the electric vehicle which remarks were very promiconvention, was very complimentary in his remarks renently displayed in the press; and it is probably safe to say the electric vehicle secured more space in from the press than any other subject discussed at the convention.

The Society for Electrical Development has been and is keenly interested in the promotion of electric vehicles. Very close relations have been for some time established between the general offices of the society and our association and we are deeply appreciative of the valuable assistance which the society has been able to lend on a number of occasions.

At the Narragansett Pier Convention of the *New England Section* of the *N. E. L. A.*, September 2 to 4, the committee upon the recognition of electric vehicle interests in New England, of which H. H. Atkins, Boston Edison Company, is chairman, submitted a report on the state of the electric vehicle, based upon replies sent to 75 representatives of central stations, 67 of which responded to the request for information. Of these companies, 31 make use of an aggregate of 78 passenger and 179 commercial electrics in their own business, while 36 make no use of electric vehicles. In the territory covered it is estimated that over 757 passenger and 341 commercial electrics are in use aside from those in central station work, or a total of 814 passenger and 520 commercial cars. The total number of electric vehicles in use in New England at present is not far from 1,500.

The Ohio Electric Light Association have been particularly active in furthering electric vehicle interests the past year, and the newly elected chairman of the electric vehicle committe, C. W. Chappelle, is planning to work closely with the general office in acquainting all the members of his association as to ways and means of arousing and stimulating interest in electric vehicle matters.

Southwestern Electric and Gas Association, held in Galveston, an electrical parade, which featured electric vehicles, and the electric vehicle was also the subject of one of the important papers given before one of the technical sessions of the convention. It has been stated that this convention did much to awaken interest in the southwestern part of this country.

Electric Day.—Robert Montgomery, manager of the commercial department of the Louisville Gas & Electric Company, suggested the development of "Electric Day" which might be generally celebrated, the electric vehicle playing a conspicuous part.

Data Files.—It has been a rather difficult matter to quickly obtain desired data with reference to the operation and maintenance of electric vehicles. We have now the nucleus of a data file which we are making every effort to augment as quickly as possible, in order that we may be in a position to supply promptly and completely data requested of the general office. We recently started a gasoline vehicle file which it is hoped will supply us with comparative data, something which the office heretofore has not had access to.

Vehicle Registration.—It is an exceedingly difficult matter to ascertain the exact number of electric vehicles, both passenger and commercial in actual operation in this country. The estimated number of electric vehicles varies with the methods employed by various authorities. Based on figures compiled by the "automobile," there were on July 1, a total of 1,548,350 automobiles gas and electric in the country. This was an increase of 250,000 since January 1, 1914. In the sixteen states in which the statistics of electric vehicles were kept separate from those of gas cars, the former represent about 4.65 of the whole number of automobiles in use. If this percentage holds in the other states, the total number of electric vehicles—passenger and commercial—would be about 72,000. Electric commercial vehicles in these 16 states were about 18 per cent of the total number of commercial vehicles reported. It will be noted that only 16 states in the 48 states register separately electric vehicles, an unfortunate condition which we should endeavor to immediately rectify.

State or Territory	Registration up to July 1914	Gasoline passenger cars in use	Gasoline commercial cars in use	Electric passenger cars in use	Electric commercial cars in use
Alabama	5,500	•	•	•	•
Arizona	3,583	4,027	208	16	None
Arkansas	3,000	•	•	•	•
California	60,000	•	•	•	•
Colorado	13,000	•	•	•	•
Connecticut	23,263	21,555	2,375	400	200
Delaware	2,373	•	•	•	•
Dist. of Col.†††	16,625	16,276	603	710	90
Florida	9,372	•	•	•	•
Georgia	22,000	18,335	335	315	15
Idaho	2,173	•	•	•	•
Illinois	94,656	•	•	•	•
Indiana	44,738	53,000	2,000	1,000	500
Iowa	70,294	•	•	•	•
Kansas	34,366	•	•	•	•
Kentucky††	7,210	•	•	•	•
Louisiana†	3,200	•	•	•	•
Maine	10,570	12,195	498	5	2
Maryland	14,254	16,558	1,440	150	100
Massachusetts	16,746	56,990	6,209	823	695
Michigan	54,366	•	•	•	•
Minnesota	37,800	•	•	•	•
Mississippi†	3,000	•	•	•	•
Missouri	38,140	•	•	•	•
Montana	5,686	•	•	•	•
Nebraska	47,274	•	•	•	•
Nevada	1,131	1,201	64	•	•
New Hampshire	7,436	8,651	50	45	20
New Jersey	51,360	49,567	2,282	•	•
New Mexico	1,721	•	•	•	•

New York.....	132,664	123,722	12,180	7,000	2,992
North Carolina	10,000	*	*	*	*
North Dakota.....	13,075	15,065	15	15	None
Ohio	86,156	*	*	*	*
Oklahoma†	4,900	*	*	*	*
Oregon	13,957	*	*	*	*
Pennsylvania	80,178	100,000	3,000	7,455	2,461
Rhode Island	10,182	*	*	*	*
South Carolina.....	11,500	*	*	*	*
South Dakota.....	14,578	*	*	*	*
Tennesse	14,103	*	*	*	*
Texas‡	54,363	*	*	*	*
Utah	4,021	4,939	117	117	6
Vermont	5,918	6,592	180	4	5
Virginia	9,022	*	*	*	*
Washington	24,178	*	*	*	*
West Virginia.....	5,088	*	*	*	*
Wisconsin	34,646	*	*	*	*
Wyoming	1,584	*	*	*	*
	1,279,950	508,673	31,556	18,055	7,086

NOTE.—3,000 steam passenger cars and 250 steam trucks are included among the gasoline machines. Dots indicate that previous figures are doubtful, discrepancies indicating that the registration officials have made an error in reporting. *Not listed separately by registation officials. †Estimated on basis of population with reference to location and sectional registration. ††New law makes registration figures low. †††Figures are high as many registrations are included. ‡Estimate furnished by Dallas Chamber of Commerce, which states that figures given are very conservative.

With a view to effecting a uniform method of reporting automobile registration, the following letter was sent under date of August 5 to each secretary of the 48 states in this country:

"With a view of facilitating the analyses of motor vehicle registration, we are soliciting the co-operation of the secretaries of States in indicating on the records after the motor vehicle registration number, the initials "G" for gasoline, "E" for electric, "C" for commercial and "P" for passenger, as the case may be.

"Illustration:

0000 G P (gasoline passenger).
0000 E C (electric commercial).
0000 G C (gasoline commercial).
0000 E P (electric passenger).

"We would very greatly appreciate your co-operation in this particular advising whether it would be possible for you to install such a system. If so, when?

"Thanking you for your courtesy in this matter, we remain,"

Generally speaking, the suggestion was favorably received and a number of States have indicated their intention of putting same into effect between now and January 1, 1915.

General Office.—Last February at the time of the creation of the general office, we moved from the New York Edison Company's Building, 124 West 42nd street to the United Engineering Society's Building, 29 West 39th street, where we were provided with a temporary office on the first floor until such time as permanent quarters could be obtained. Through the courtesy of the National Electric Light Association, who gave up a couple of rooms in the Society building, we were able to move in August to the seventh floor, rooms 714 and 715, where we are well housed and arranged to do efficient work. A cordial invitation is extended all to become acquainted with the general office and its facilities.

The executive secretary in closing announced the arrival of E. S. Marlow, who with the Washington delegation had just arrived, having made a trip from Washington to Philadelphia in two electric vehicles. Mr. Marlow read the following message personally brought from President Wilson:

It is a pleasure to extend my greeting and best wishes to the members of the Electric Vehicle Association of America, and to express my earnest wish that their industry, and all those which are connected or associated with it, may prosper. It is my sincere hope that the business men of America may find for themselves and for their employees in the coming months that reward for every legitimate and intelligent endeavor which they seek, and which, through their skill and energy, they deserve.

Constitutional Revision Committee report was then presented by F. W. Frueauff, chairman, and appears elsewhere in this issue.

"What the Sections Are Doing" was next presented as follows:

New England Section enjoyed a most prosperous and successful year. All meetings have been attended by large numbers of central station officials, as well as those interested in the sale and manufacture of electric vehicles, and vehicle users.

We have been exceptionally successful in securing speakers to address the meetings on subjects of timely and instructive nature, and discussions have been interesting and spontaneous. Our first meeting was held in September, at which time J. Fortescue of the Massachusetts State Automobile Association addressed the members on the "Advisability of Uniting Interests to Properly Advise and Direct Useful and Beneficial Legislation Affecting Automobiles in the Commonwealth of Massachusetts." A great deal of interest was manifested at this meeting and much good resulted from the discussion. Suitable committees were appointed, to work in conjunction with the Massachusetts State Automobile Association and other allied interests, to properly handle the problem, and the results of their efforts of the committees have been extremely gratifying and are a decided credit to the members who gave their time and thought to this matter. Disastrous legislation in the nature of extraordinary taxation was averted, as well as beneficial legislation carefully enacted.

The next meeting in November was addressed by the president of our association, Frank W. Smith, who spoke on "The Past, Present and Future of the Electric Vehicle."

Our next meeting in December was held in the auditorium of the Boston Edison Company, and C. F. Smith of the Edison Company in charge of the entire garage and garaging facilities of that organization, gave a stereopticon lecture, describing the charging apparatus, machines, storage and equipment used by that company. Mr. Smith's paper was one of the most instructive papers presented to the organization throughout the year, and at the close of the address, all members were the guests of the Boston Edison Company on a tour of inspection to its garage.

Our January meeting was held in Salem, the first in an innovation in the New England Section, namely,—the holding of our meetings in different cities throughout the New England States. This meeting was held in conjunction with the meeting of the Salem Board of Trade. During the late afternoon a parade of electric passenger cars and electric trucks was held in the streets of Salem, which created a great deal of favorable comment and interest among Salem residents and merchants. At the evening meeting, Mayor Hurley of Salem gave a most pleasing and courteous address of welcome with hearty wishes for the success of the organization and the assurance that the City of Salem would be among the first in New England to take advantage of the benefits offered by electric vehicles. The subjects presented were of an instructive nature,—H. F. Thompson of the Massachusetts Institute of Technology describing "The Characteristics and Practical Advantages of Electric Motor Vehicles," and lantern slides were given and explained by Day Baker, showing typical installations and work accomplished by electric trucks. George Holden of the Edison Storage Battery Company and Frank J. Stone of the Electric Storage Battery Company, gave slides and instructive discussions regarding the use of their batteries. The meeting was an enthusiastic one and resulted in much good.

The February meeting was addressed by W. W. Scott of *The Motor Truck* who presented a paper on "Boston's Transportation Problems."

During the latter part of March a meeting was held at Lynn, Massachusetts, in the auditorium of the Lynn Gas & Electric Company, the local board of trade and business merchants of that city having been invited as guests for the evening. This meeting was addressed by Sewall Cabot, the inventor and manufacturer of a new type of charging apparatus, who explained and displayed this mechanical device in an instructive and entertaining manner.

Our next meeting was in May at the American House, Boston, and the principal speaker, Fred. A. Hortter of the Boston and Maine R. R., who addressed the members on the "Effect of the Motor Truck on Terminal Freight Congestion."

At this meeting there was a tentative proposal of the organization of a corporation for the purpose of putting into activity throughout the entire city of Boston, a complete transportation and trucking corporation in which electric trucks and vehicles should be used exclusively.

In November 1913 the New England section co-operated with the Electric Motor Car Club in conducting a Salon at the Copley Plaza Hotel. This was the society event of the electric vehicle residents in New England, and far surpassed any exhibit of electric passenger vehicles ever held in the country, being in its nature refined, inviting and instructive, embodying art with utility and luxury.

A valuable project was jointly undertaken by the New England section and the Electric Motor Car Club of Boston. It is proposed to exhibit in all important New England cities electric passenger cars and electric trucks under a mammoth tent to be supplied by the Boston Edison Company; these exhibits to be one or two nights in each city, and to be conducted along instructive and business lines. Due to pressure for time and volume of work that compelled attention,

this project was not completed during the year, but has been fully outlined with suitable preliminary arrangements, so that it can be undertaken during the next season.

In the month of May, of this year, the New England section joined with the Electric Motor Car Club of Boston and all electric vehicle interests in conducting a convention at the Engineers' Club, May 19-20. At this convention, much enthusiasm was manifested and many valuable and instructive papers were presented and discussed.

Chicago Section, W. J. McDowell, chairman:—At the time of preparing this report the present administration has been in office only three months, during which time no meetings have been held, so that the report covers almost entirely the work of other officers and committees.

Since the year beginning last October the matter of greatest importance was the fourth annual convention held at the LaSalle Hotel. Those meetings did a great deal of good for the Chicago section by increasing the membership to over one hundred and creating great interest in the work of the section generally.

From October to April weekly noon meetings were held and were very well attended, but early in April it was decided to have the meetings monthly in the evening, and since that time we have held our annual meeting on May 6 and another meeting on June 3. The present executive committee has held three meetings, all of which have been very encouraging to the new officers.

The third annual meeting of this section was held May 6, at which new officers and directors were elected, some of these being hold-overs from the previous year. At this meeting President Smith gave a splendid talk on the past, present and future of the association work, and other speakers gave unusually interesting talks on tires, battery charging and other vital subjects.

The social side of our meetings has been developed by the weekly luncheons, and during the winter we held what we called a "get-together" night, which proved highly satisfactory to all the members and their friends.

We have just taken part again in the second annual picnic of the Chicago Garage Owners Association, winning about half the prizes offered in athletic events. We are in close touch with the Chicago Garage Owners Association, and also the Garage Owners Association of Illinois, aiding them in bettering the conditions and general facilities in electric garages throughout the city and state. The chairman of our garage committee is one of the leading men in the Garage Owners Association, and he, with others, attended the meeting of the national garage and rate committee in Detroit last July.

Upon recommendation of the executive secretary's office, the local executive committee recommended to the secretary the abandonment of its constitution and by-laws and the substitution of the constitution and by-laws of the national organization, as well as the adoption of the guide on section management. The vote on this question has been unanimous in favor of the change, which involves another election in October so that the term of office of this section will correspond with that of the national organization.

We are again co-operating with other automobile interests in the annual orphan's day, which will take place early in September.

Our traffic committee is working closely with similar conditions of other organizations and with the police department, in an effort to solve the problem of parking of passenger cars in the business district and to make changes in the streets and alley regulations of commercial vehicles. Another committee is at work with the railroad freight traffic managers, trying to better the loading and unloading facilities at freight houses so that trucks will lose as little time there as possible. We are also giving some aid to the associated good roads organization in their efforts to collect the city wheel tax, and see that the funds are properly used in the repair of streets.

Our officers have assisted the faculty of the Armour Institute of Technology in preparing a course on electric vehicle practice, which will open this fall. A number of students from central stations and garages have already registered.

Our membership is 116, and we have been unfortunate in losing by removal to other lines of business and other cities three of our leading members who were managers of the electric commercial vehicle companies. We also lost by death Fred Newman, one of the organizers of this section and the pioneer electric passenger car designer of the Middle West.

Our statistician reports 803 electric commercial vehicles and 2,300 electric passenger cars in use in Chicago at the time of preparing this report.

Recent reductions in prices of both commercial and passenger cars and reduction in rates by the Commonwealth-Edison Company, make us believe we will have a a very prosperous year in the electric vehicle industry in Chicago and vicinity.

Our plans for the 1914-15 season contemplate monthly evening meetings with extremely interesting programs and very active work by our various committees.

Philadelphia Section, R. Louis Lloyd, chairman.—The Philadelphia section was organized at a meeting held about the middle of December, 1913, at which officers and an executive committee were elected.

The first general meeting was held in the Franklin Institute on Wednesday evening, January 14. Invitations had been sent to every known owner or operator of electric vehicles in Philadelphia. There were also present several distinguished visitors from other cities, amongst whom were President Frank W. Smith and Secretary Harvey Robinson. Addresses were made by the chairman of the section and by President Smith of the parent body, and the balance of the evening given over to an illustrated talk on using electric vehicles generally. Following this meeting, monthly meetings were held regularly on the second Wednesday of each month, the following subjects having been presented during the season: "Practical Experiences from Electric Truck Service;" "Charging Apparatus in Public and Private Garages;" "Symposium on the Care of Cars in Electric Garages;" "Some Investigations of Electric Vehicle Tires;" "Traffic Regulations in Philadelphia."

Printed notices of each of these meetings were sent not only to the members of the section, but also to a selected list of car owners and others interested in the subjects. The average attendance at the meetings was in the neighborhood of 50.

An endeavor was made to have such papers read and discussed as would be of general interest to those likely to attend the meetings and we were fortunate in having very interesting papers read by authorities on the subjects covered.

In addition to these general meetings, the executive committee also held meetings, and activity has also been secured by the several committees appointed.

Our membership committee has done such good work that the membership now numbers three times the membership at the formation of the section.

Our traffic committee has devised a plan of work in harmony with the work of the similar committee in the national body, and it is their intention to co-operate with similar committees in other organizations in this city.

The garage committee has been very active and has established a standard for the operation of garages which must be met, if the garage is to be recognized by the association. Some few signs have been distributed and hung.

The executive committee has continued to hold meetings through the summer. It has had general supervision over the activities of the several committees and is considering the advisability of having an annual run about the country for electric vehicles. These matters in connection with the details of preparing for the convention have kept the executive committee pretty well occupied.

Washington Section, E. S. Marlow, chairman.—The Washington section was organized at a meeting held on March 12, 1914, which was attended by President Smith and nineteen Washington members of the parent organization. After an extremely interesting address by President Smith a definite organization was formed and officers elected to hold office until October, 1915.

Exclusive of this organization meeting, the section has held three monthly meetings, at which technical papers were presented, and during which the attendance has shown a healthy growth, until at the last meeting there were forty-five members and guests present.

During May the section held a sociability run for electric vehicles in which there were fifty-three cars entered and fifty-two actually started. This run ended with a picnic in Rock Creek Park, and was a great success.

A lunch club has been organized, from the members of the local section, which meets the fourth Tuesday in each month.

The work of the section has been largely that of perfecting our organization and plans, and we are in a position to start the new year with a thoroughly organized effort in the interest of the electric vehicle.

San Francisco Section, S. V. Walton, chairman, was authorized at a meeting of the board of directors of the asso-

ciation, held in the office of President Smith, in New York, on Friday, April 24, 1914.

Fred J. Brand, 639 Van Ness Ave., San Francisco, representing the Guarantee Battery Co., Pacific Coast Distributors of the Philadelphia Battery.

W. G. Bardens, care Pierson, Roeding & Co., San Francisco.

Geo. R. Murphy, care Pierson, Roeding & Co., San Francisco.

T. A. Dooling, care Pierson, Roeding & Co., San Francisco.

C. G. Gauntlett, care Pierson, Roeding & Co., San Francisco. Pacific Coast agents for the Exide Battery.

S. V. Walton, 445 Sutter St., San Francisco, Manager Commercial Dept., Pacific Gas & Electric Co.

J. W. Redpath, Crossley Building, San Francisco, *Journal of Electricity, Power and Gas.*

C. A. Conry, Ohio Apartments, Berkeley, Cal., connected with Pacific Gas & Electric Co., Vehicle Dept.

R. W. Street, 2510 Buena Vista Way, Berkeley, Cal.. Coast Representative for Walker Trucks.

R. Scraba, 326 Santa Clara Ave., Oakland, Cal., Oakland Representative of Gould Storage Battery.

W. D. Vance, 2969 Broadway, Oakland Representative of Rausch & Lang.

C. W. Hutton, 3618 Kingsley St., Oakland, Cal., Coast Representative of General Vehicle Co.

E. M. Cutting, 441 Golden Gate Ave., San Francisco, representing Edison Storage Battery.

B. Smith, 441 Golden Gate Ave., San Francisco, with Mr. E. M. Cutting.

A. G. Jones, Rialto Building, San Francisco, General Electric Co.

O. A. Schlessinger. 135 Second Street. San Francisco, Representing United States Light and Heat Co.

I. G. Perin, Reliance Automobile Co., 1529 Van Ness Ave., San Francisco, representing Detroit Electric Vehicle.

I. L. DeJongh, 511 Golden Gate Ave., San Francisco, representing General Motors Co.

O. W. Lillard, 1440 Van Ness Ave., San Francisco, Pacific Coast Representative of Gould Storage Battery.

The organization of the section was effected by electing S. V. Walton as chairman, C. W. Hutton as vice-chairman and J. W. Redpath as secretary.

No regular meetings of the section have been held up to date, although there have been several meetings of the executive committee.

On July 15 the automobile section of the Transportation Palace of the Panama-Pacific Exposition was dedicated, the dedication being preceded by a lengthy automobile parade. Our section took up actively the question of getting a good representation of electric trucks and pleasure machines in the parade, and succeeded in having a number of machines in line, although we found that the representatives of the various machines were not particularly anxious to put their own machines in the parade or ask those who had purchased machines from them to enter the parade.

Los Angeles Section, J. Harry Pieper, chairman, has a total membership of forty-four, which represents all branches of the industry.

Nearly every electric pleasure car manufactured has an agency in this section and these agencies are all represented in our membership.

The manufacturers' agents of the Edison Storage Battery Company, Electric Storage Battery Company, Philadelphia Storage Battery Company, and Gould Storage Battery Company are enthusiastic members of our section. Of the tire companies, we have but one, the Firestone Tire and Rubber Company, represented by A. T. Smith, formerly of Chicago, and some booster.

The three central stations are represented by three active and four associate memberships, all promoting the sale and use of electric vehicles; the Southern California Edison Company having in operation sixteen commercial vehicles and five pleasure cars.

When the petition for the Los Angeles section was granted by the board of directors, we held one meeting for organizing; officers were elected and committees appointed, then adjournment was made for the summer months. Since then, we have had no meeting, the first regular meeting of the season being called for the evening of October 7. A report of this meeting could not be made in time to be read at the convention.

During the summer months the membership and garage committees have been very active. The result of the activity of the membership committee will doubtless be shown in an increased membership as we anticipate a few applications to be presented at our first regular meeting. The garage committee has been active along the lines of establishing charging facilities throughout the section in order that touring in electric vehicles would be safe. The garage owners have co-operated with the result that tours of from 100 to 200 miles are safe.

The electric commercial vehicle is fast coming into its own in Los Angeles. Electric delivery has been adopted by four of the leading department stores, the leading retail grocery house, wholesale grocers and milling companies, as well as by the American Express Company. We are making every effort to secure as members the delivery managers of all these concerns and we have every reason to expect a busy season with increased membership.

Pittsburgh Section, A. J. Pierce, chairman.—Section formed and petition accepted by the board of directors June 19, 1914.

Membership September 30, 1914: Active, 2; Associate, 27; Auxiliary, 0; Press, 1; Total, 30.

The absence of a definite report from this section is not to be taken as an indication of dormancy. Insufficient time has elapsed since the formation of the Pittsburgh section to permit work to be actually inaugurated. Furthermore, the section was formed during what might be characterized as the summer months, and we all know how difficult it is for a new body to get under way during the vacation period.

There is unmistakable evidence of interesting developments in connection with the Pittsburgh section's work, and it is possible that some verbal report may be made by some representative of the Pittsburgh section during the course of the convention.

New York Section, H. Robinson, Chairman.—Section formed and petition accepted by the board of directors, July 15, 1914.

Membership September 30, 1914: Active, 17; Associate, 172; Auxiliary, 3; Press, 18; Total, 210.

The following New York section committee have been appointed under the chairmanship of gentlemen peculiarly qualified to carry on the work contemplated: membership, papers, and publicity, reception, nominating, garage, performance and operating records, traffic, insurance, legislation and statistics.

The reception committee is on duty at each meeting of the section, the intention being to extend a cordial welcome to new members and visitors.

The insurance committee is getting ready to go after the insurance association with the hope of determining just why electrically propelled automobiles should be compelled to pay the same rate for liability insurance as other forms of motor vehicles.

The first meeting of the section was held on September 30 when a paper entitled "Practical Ideals in Electric Vehicle Promotion" was presented and enthusiastically discussed.

It is the hope of the New York section to be the most prominent body in the electric vehicle industry and to this end we invite the competition of our brother sections.

Detroit Section, J. W. Brennan, chairman.—Section formed and petition accepted by the board of directors July 15, 1914.

Membership September 30, 1914: Active, 5; Associate, 38; Auxiliary, 0; Press, 0; Total, 43.

The absence of a definite report from this section is not to be taken as an indication of dormancy. Insufficient time has elapsed since the organization of the Detroit section to permit work to be actually inaugurated. Furthermore, the section was formed during what might be characterized as the summer months, and we all know how difficult it is for a new body to get under way during the vacation period.

There is unmistakable evidence of interesting developments in connection with the Detroit section's work, and it is probable that some verbal report may be made by some representative of the Detroit section during the course of the convention.

Cleveland Section.—Section formed and petition accepted by the board of directors July 15, 1914.

Membership September 30, 1914: Active, 3; Associate, 13; Auxiliary, 0; Press, ½; Total, 16.

The absence of a definite report from this section is not to be taken as an indication of dormancy. Insufficient time has elapsed since the formation of the Cleveland section to permit work to be inaugurated. Fruthermore, the section was formed during what might be characterized as the summer months, and we all know how difficult it is for a new body to get under way during the vacation period.

There is unmistakable evidence of interesting develop-

ments in connection with the Cleveland section's work, and it is probable that some verbal report may be made by some representative of the Cleveland section during the course of the convention.

Toronto Section.—The very unusual conditions prevailing in Canada have not been conducive to the organization and active operation of the Toronto section, which we had expected to be very active long before this time.

However, there has been considerable interest manifested in and about Toronto as regards the promotion of electric vehicles, and it is interesting to report that five large electric trucks have been sold in this city during the past four weeks. This is an indication that the electric truck is meeting favor although financial conditions preclude the possibilities of making any large investments on capital accounts at the present time.

The many organizations formed at the present time for the assistance of those who are dependent upon the soldiers leaving this country for the front, has demanded the attention of a large percentage of our people. The executive heads of a great many large companies in this country have enlisted for the service of their country and empire with the ultimate object of crushing for all time the recurrence of any such catsastrophe which is now overwhelming the European countries. We all wish them God speed on their mission, and sincerely hope that they will return and find the country in a position to take up their labors where they left off.

St. Louis Section, C. E. Michel, chairman.—Section formed and petition accepted by the board of directors August 25, 1914.

Membership September 30, 1914: Active, 2; Associate, 16; Auxiliary, 0; Press, 0; Total, 18.

The absence of a definite report from this section is not to be taken as an indication of dormancy. Insufficient time has elapsed since the formation of the St. Louis section to permit work to be inaugurated. Furthermore, the section was formed during what might be characterized as the summer months, and we all know how difficult it is for a new body to get under way during the vacation period.

There is unmistakable evidence of interesting developments in connection with the St. Louis section's work, and it is probable that some verbal report may be made by some representative of the St. Louis section during the course of the convention.

Denver Section, E. M. Jackson, chairman.—Section formed and petition accepted by the board of directors August 25, 1914.

Membership September 30 1914: Active, 1; Associate, 17; Auxiliary, 0; Press, 0; Total, 18.

The absence of a definite report from this section is not to be taken as an indication of dormancy. Insufficient time has elapsed since the formation of the Denver section to permit work to be inaugurated. Furthermore, the section was formed during what might be characterized as the summer months, and we all know how difficult it is for a new body to get under way during the vacation period.

There is unmistakable evidence of interesting developments in connection with the Denver section's work.

Day Baker followed with a presentation of the association's treasure report as follows:

TREASURER'S REPORT, ENDING SEPTEMBER 30, 1914.

PUBLICITY AND ADVERTISING FUNDS FROM OCTOBER 1, 1913, TO MAY 1, 1914.

Receipts:		
Balance from preceding year	$ 4,776.26	
Subscriptions to fund	28,109.20	
Booklets, signs and matrices	999.16	
Interest	92.00	
Total receipts		$33,976.62
Disbursements:		
Advertising and mechanical charges	$26,392.07	
Office rent and telephone	88.69	
Executive Secretary's salary	693.39	
Office help	442.00	
Printing	920.20	
President's expenses	123.05	
Postage and incidentals	35.07	
Bank exchange	8.54	
Transfers to Association account	276.17	
Total expenditures		$28,979.18
Balance on hand May 1, 1914		$ 4,997.44

The publicity and advertising fund was on May 1, 1914, merged into the association fund, by consent of the contributors and direction of the board of directors, as shown in the association account:

ASSOCIATION ACCOUNT.

Receipts:		
Balance from preceding year	$ 1,062.90	
Dues	5,384.65	
Miscellaneous items	505.11	
Interest	46.05	
Association funds in P. & A. account	645.52	
May 1, 1914, transferred from P. & A. account	4,997.44	
Total receipts to July 1, 1914		$12,641.67
Disbursements:		
Payments to New England Section	$ 261.50	
Payments to Chicago Section	229.50	
Payments to Philadelpbia Section	68.95	
Payments to Washington Section	29.87	
Expense to New York meetings	221.02	
Chicago Convention expenses	298.25	
Subscriptions to Central Station	513.50	
Printing and office supplies	3,073.78	
Postage and incidentals	242.81	
Office expenses	140.02	
Officers' bonds	100.00	
Auditing books	50.00	
President's traveling expenses	100.00	
Executive Secretary's salary	432.63	
Executive Secretary's traveling expenses	252.20	
Secretary's traveling expenses	50.00	
Office help	1,527.80	
Office furniture	762.34	
Office rent and telephone	105.84	
Signs	3.05	
Parcel post campaign	74.30	
Transfer to P. & A. account	50.00	
Bank charges—exchange	2.65	
Contribution to New York City Street Committee	100.00	
Total disbursements		$ 8,690.01
Balance on hand July 1, 1914		$ 3,951.66

INCOME JULY 1, 1914, TO SEPTEMBER 30, 1914.

Current dues:			
Manufacturers' active members		$151.25	
Electricity supply, company's active members:			
Class "A"	$75.00		
Class "B"	75.00		
Class "C"	50.00		
Class "D"	37.50		
		237.50	
Press members		25.00	
Associate members		580.00	
			$993.75
Transactions—sale of papers			22.50
Advertising:			
Booklets, pamphlets, etc		52.50	
Forms, cuts, etc		6.00	
			58.50
Refunds (expenditures prior to July 1, 1914)			53.72
Rent of official signs			21.00
Back dues			70.00
Advance dues			150.00
Total receipts			$1,369.47
July 1, 1914, balance on hand			3,951.66
			$5,321.13

EXPENDITURES.

Executive Secretary's office:			
Salaries		$1,320.91	
Rent		116.67	
Stationery, printing and office supplies		235.95	
Postage		141.28	
Telephone, telegrams and expressage		74.53	
Miscellaneous		198.31	
			$2,087.65
Publicity campaign (booklets, pamphlets, etc.)			293.00
Transactions:			
Official organ		174.00	
Composition, paper, etc		15.00	
			189.00
Official signs			7.76
Sections:			
Chicago		38.41	
Philadelphia		16.95	
Washington		43.04	
Los Angeles		42.25	
Pittsburgh		36.14	
New York		41.50	
Detroit		41.36	
Denver		33.00	
			292.65
Special convention expense			269.63
Miscellaneous			191.02
Total expenditures			$3,330.71
Sept. 30, 1914, balance on hand			1,990.42
			$5,321.13

Outstanding accounts receivable as follows:

Classification	Manufacturers Active $50.00	Central station Active $50.00	Central station Active $25.00	Central station Active $10.00	Central station Active $5.00	Associate $5.00	Auxiliary $5.00	Press $10.00	Official signs Rentals	Miscellaneous	Total
No. accts. 1911-12	—	—	—	—	—	9	—	—	—	—	9
Amt. in dollars..	—	—	—	—	—	42.50	—	—	—	—	42.50
No. accts. 1912-13	1	—	—	—	1	33	—	—	—	—	35
Amt. in dollars..	50.00	—	—	—	5	152.50	—	—	—	—	207.50
No. accts. 1913-14	2	—	1	—	1	114	1	2	2	4	127
Amt. in dollars..	98.75	—	25.00	—	5.00	515.00	25.00	20.00	23.00	276.25	988.00
No. accts. 9-1-14.	3	—	1	—	2	156	1	2	2	4	171
Grand totals:											
Amt. in dollars.	148.75	—	25.00	—	10.00	710.00	25.00	25.00	23.00	276.25	1,238.00

Grand total, $1,238.00.

ESTIMATED INCOME FOR THE COMING YEAR.

The treasurer would like to call the attention of the association to the desirability of raising more funds the coming year, for the purpose of carrying on various forms of publicity, and conducting business in such a manner that the members may be benefited in a substantial way. It is not sufficient that we get together, read papers of a more or less scientific nature and organize sections in various parts of the country. We should find some method of educating the mind of the business man and the users of passenger vehicles to the possibility of the electric performing their various requirements—we must popularize the electric vehicle in order that the manufacturers and all our members may be permanently benefited. Education means publicity; publicity means advertising; advertising means money. This association is now big enough to and should raise a good sum of money to advertise, educate and popularize, and make a signal success of electricity as a means of business and passenger road tranportation.

Mr. Baker also presented a paper outlining the activities of the Electric Motor Car Club of Boston. This paper will appear in a future issue of ELECTRIC VEHICLES.

The next report was on parcel post delivery, presented by James H. McGraw and appears in full elsewhere in this issue. This report was discussed enthusiastically by W. P. Kennedy, P. D. Wagoner and E. S. Mansfield.

"Membership and Formation of Sections" was next presented by J. F. Becker, chairman, and will appear in another issue.

President Smith then appointed a nominating committee composed of W. H. Blood, Jr., G. H. Kelly, G. B. Foster, W. G. Bee and P. D. Wagoner.

P. D. Wagoner, chairman, Committee on Legislation was next called upon to present his report. This paper will be published in full.

The report of the Committee on Garage and Rates, very ably presented by George B. Foster, followed and appears elsewhere in this number.

"Stimulating Electric Vehicle Progress," by James H. McGraw, "Power Wagon Operation and Central Station Co-operation," by W. A. Manwaring; an address entitled, "A Wider Dissemination of Electric Vehicle Information," by T. I. Jones; "The Cost of Electric Vehicles," by George H. Kelly; "Educating the Public in the Field," by F. C. Henderschott, were papers presented in order and resulted in many various phases of discussion. New statistics were presented and much data brought to light which had never been previously offered.

The Tuesday session closed with interesting papers by H. P. Dodge, on "Constant Potential Systems for Charging and Motor Generators"; "The Trend of the Electric Vehicle Manufacture"; and a paper entitled "Electric Vehicle Performance," by R. B. Grove; all of which papers were thoroughly discussed.

Wednesday morning session opened with the presentation of the Standardization Committee report by E. R. Whitney. This report will appear in full in the next issue of ELECTRIC VEHICLES. Discussion followed by Messrs Brennan, Russell and Whitney.

Traffic Committee report, which appears in full in this number, was then presented by D. C. Fenner, chairman. Following this, a paper entitled "Electric Automobile Motors" was presented by H. S. Baldwin. This paper was a comprehensive technical paper, well presented, and will appear in the next issue.

"Effects from the Utilization of the Kinetic Energy of an Electric Vehicle," by T. H. Schoepf was next delivered and numbers among the most important papers presented during the convention.

This paper was followed by the election of officers, which resulted as follows:

President, John F. Gilchrist, Chicago; vice-president, Walter H. Johnson, Philadelphia; treasurer, H. M. Edwards, New York City. Directors, Frank W. Smith, New York; Charles Blizard, Philadelphia; E. P. Chalfant, Chicago, and J. H. McGraw, New York.

Wednesday afternoon at the concluding session, "Calculations of Electric Vehicle Performance" was presented by A. A. Nims. J. C. Lincoln followed with a paper entitled, "Charging Apparatus for the Private Garage." This was followed by a paper entitled, "The Electric Industrial Truck," contributed by the Automatic Transportation Company, the Elwell-Parker Electric Company, the General Vehicle Company, and C. W. Hunt Company. Stereopticon views were used to illustrate the products of the various companies.

Monday evening was devoted to ladies' night. During this session J. C. Bartlett delivered an address, "An Answer to Dr. Steinmetz." This paper dealt with the lack of demand for a cheap electric and will be published in full in a future issue.

F. Nelson Carle delivered the last lecture of the convention. Mr. Carle's lecture was on special applications of electric trucks. The address was illustrated by stereopticon views.

The convention concluded with the production of the association's moving picture entitled, "Selling Electric Vehicles."

Considering the convention from all angles, it was without a doubt the most successful and largest meeting ever held by electric vehicle interests. Suggestions made during this meeting will no doubt be put into operation, and it is hoped that during the coming year every one associated with the industry will become a member of this great organization for the promotion of electric vehicle service.

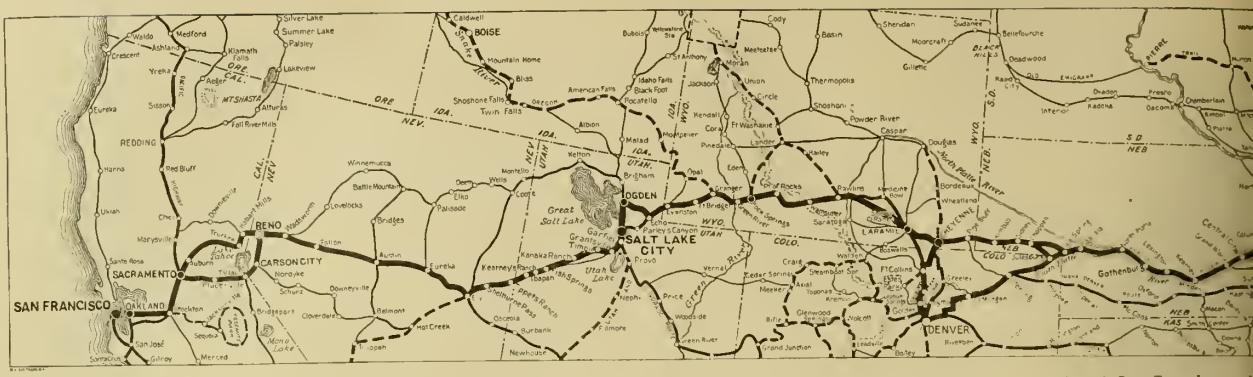
Tires Save Soldiers

Many stories have been told of the Mexican revolution that caused laughs from people who know. But the palm should be awarded to an automobile tire manufactory that sends out this one:

Not long since when Pancho Villa's men were making an advance near El Toro, one of the motor trucks in the main force ran out of gasoline. A service truck loaded with gasoline, oil, extra tires and a complete repair outfit was ordered up from the rear and refilled the gas tank. The march was continued and the service wagon then waited for the rear guard to come up. While the truck was thus resting in the road between the main body and the rear guard, the federals, under Colonel Coo-Coo, made an attack on the service car from the left flank. All the service squad had in the way of weapons was a sack of Bull Durham, a spy glass and a shotgun.

Nothing daunted, corporal Pedro ordered the spare tires with their steel rims, which the service wagon carried, unloaded from the truck and placed as a barricade. Behind this rubber and steel bulwark, Villa's men felt safe.

As the federals fired, the bullets rebounded and killed Colonel Coo-Coo's men in great numbers; the gallant Coo-Coo himself being among the five killed or wounded. Thus weakened, the federals were forced to retreat. When the rear guard came up, they found the service wagon crew enjoying a quiet game of monte within the confines of the rubber rampart.



Lincoln Highway Showing Locations of Charging Stations Between New York and San Francisco. A

Garage and Rates Committee Report

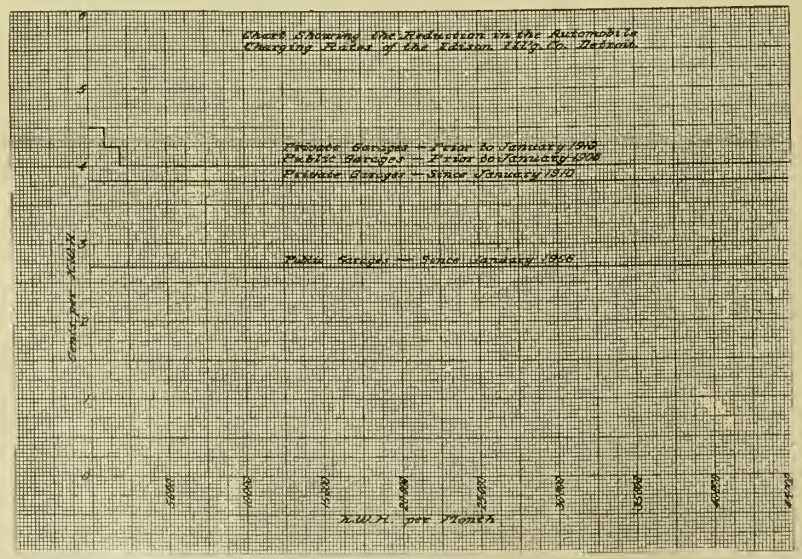
Presented to the Fifth Annual Convention

THE Garage and Rates Committee believes that it can best serve this Association at this time by starting to collect and compile data on facilities for electric vehicle charging outside of our larger centers of population. Beyond a doubt, carefully selected information properly recorded in the office of the executive secretary of the Association will be very valuable. The owner of a gasoline car has no thought as to where he will stop to replenish his supply of fuel, for he knows that gasoline can be had in every hamlet throughout the country, but not so with the driver of an electric car. On the contrary he knows that comparatively few places are provided with the proper charging facilities and his course must be carefully planned in advance with certain knowledge that he can get electricity in a form that he can use at predetermined places and these places cannot be chosen at random according to the population they boast of, or the hotels they support, but the route must be planned according to information secured in advance and, strange to say, it is not easily obtainable.

This committee before starting this work made a careful study of the undertaking and came to the conclusion that it must follow either one of two plans: (a) The selection of certain well traveled routes with cities at frequent intervals, or; (b) the development of the work by districts, as New York, Boston, Philadelphia and Chicago have done, and gradually adding thereto.

It is the opinion of this committee the better plan to follow is the development of the route plan, for it is evident that no one particular commercial interest would be willing to spend its money on this proposition. The work already done in the above mentioned cities shows that the central station interests are alive to the situation and can be relied upon to continue the development of the district plan for their own immediate interest.

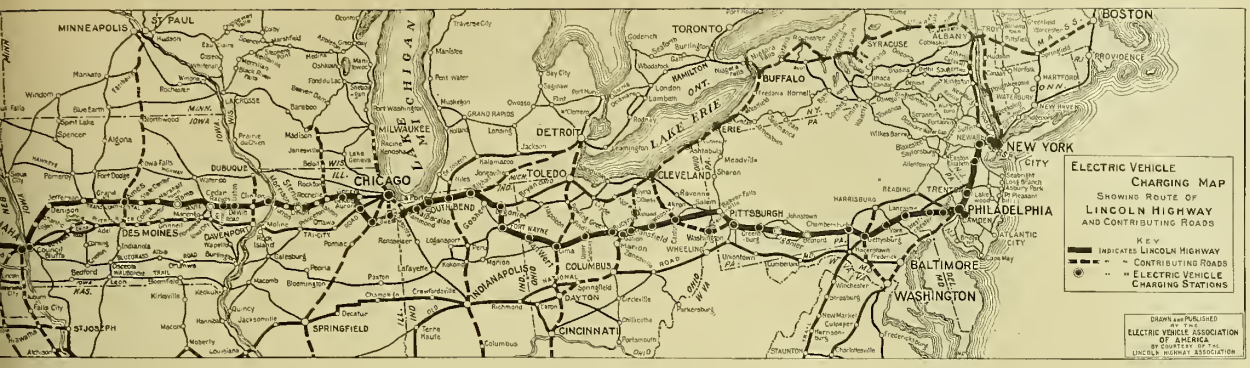
The committee has chosen for its initial effort, therefore, the collecting, compiling and publishing of the data obtainable regarding charging facilities along the route of the Lincoln Highway. The data collected is quite complete for the section between New York and the Mississippi River. The section west of the Mississippi River has been carefully canvassed and much data collected, but the committee feels that it is by no means complete. It is, however, probably of some value and is therefore published so that it may be preserved as a matter of association record.



Curves Showing Reduction in Charging Rates of Boston Edison Company.

Owing to the long distance between charging stations in certain localities, the committee has taken the liberty of slightly changing the route—notably as follows: Between Philadelphia and Lancaster, a charging point has been located at West Chester, which makes the stretch much easier and road conditions are also reported favorable. Between Pittsburgh and Canton, Ohio, the route has been shown by the way of Steubenville. This latter change is necessitated by the absence of all information regarding facilities in places between Pittsburgh and Canton via the official route of the Lincoln Highway. The road via this cutoff, according to the "Automobile Blue Book," is shorter and preferable to the Highway.

In explanation of the tabulation entitled "Lincoln Highway Charging Stations," the first column of figures represents the distance from New York City; the second column indicates the distance between charging stations. Where figures have been omitted in this column, we have been unable to find charging facilities. In the third column are the names of the cities through which the Lincoln Highway passes, which are reported in "McGraw's Electrical Directory" as having electric light plants, or sub-stations. It



anges Have Been Made from the Natural Route to Connect with Charging Stations Just Adjacent.

will be noted that there are several long stretches between charging stations, the most serious one being from Chambersburg to Greenburg, a distance of 123.2 miles.

BATTERY SERVICE SYSTEMS.

Battery service is a live issue and the committee feels that this subject should be given special attention by the Association for the reason that if it proves commercially successful it can be relied upon to do more to stimulate the introduction of electric vehicles than any other means. It was to be hoped that we might have some late figures from the Hartford Company, but unfortunately they are not available. The Washington Water Power Company is operating a maintenance system in Spokane. M. C. Osborne, commercial agent of that company, advises that the system has not been in practical operation long enough to report definitely how successful it is. He seemed, however, very sanguine regarding the results to be expected. The rates for this service differ somewhat from those offered by the Hartford Company and are therefore given herewith. The chassis is sold by the Power Company with a universal battery cradle and a contract is entered into at the time of sale, for the battery service on the basis of a fixed charge, plus a mileage charge. These charges are shown in the table entitled "Complete Garaging, Including Battery Maintenance Service, Storage, Energy, Washing and Routine Adjustments."

E. W. Lloyd, general contract agent of the Commonwealth Edison Company, Chicago, brings a very interesting report of two battery maintenance system in Berlin:

One company has 700 vehicle batteries and another one 450, each of 150 ampere hours capacity. These two plants furnish the battery service for practically all of the 600 taxicabs in Berlin and a few private cars in addition.

These maintenance companies charge the taxi operators three cents per kilometer (nearly 5/8 mile) for battery service, including minor repairs to the car, but this does not include washing and garaging. The chauffeurs receive as their compensation 25 per cent of the fares plus all tips. The expense for washington the cap is 25 cents and one-half of this charge is taken out of percentage earned by the chauffeurs.

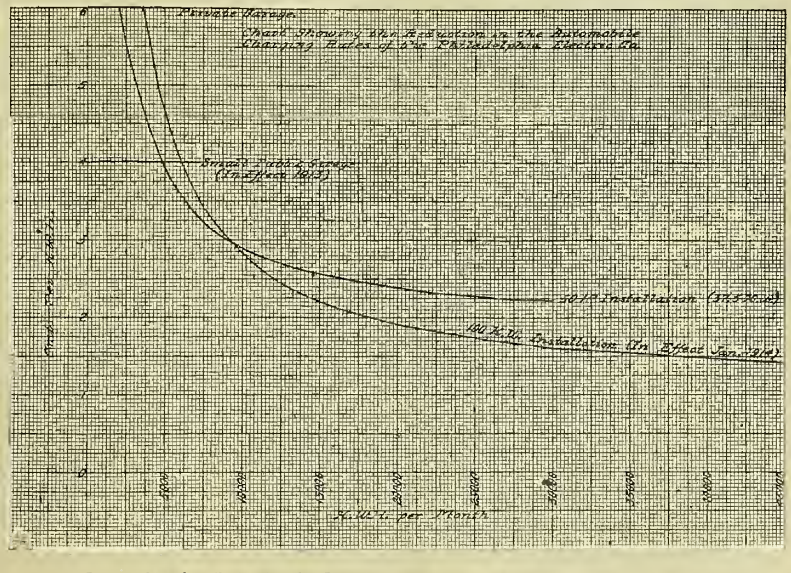
The chauffeurs of the taxicabs are required to come in at certain specified hours for change of batteries. This distributes the load and reduces the number of employees in the station to a minimum. When the cab comes in for a fresh battery the odometer reading is taken and collection is made of the chauffeur for the previous charge. When it is noted that a certain minimum mileage can not be secured from a charge the taxi is required to go to the shop for overhauling. This keeps the average consumption of electricity well down and is a suggestion to the American companies who have just started this character of enterprise, or contemplate doing so. At the charging stations the workmen are paid a premium when the battery plates show a life exceeding 10,000 kilometers. The business is conducted on a strictly cash basis and no chauffeur is allowed a second charge until the previous one is paid for. Following are some interesting facts in connection with these systems:

Number of taxicabs in Berlin, approximately	600
Cost of license—Electric taxi	$357.00
Gasoline taxi	$2,856.00
Taxi speed, maximum miles per hour	20
Watt hours per taxi per mile	560
Taxi income—average per mile	$0.16
Battery capacity, at 5-hour discharge rate	250 ampere hours
Number of cells in a battery	40
Life of battery plates (positive)	9,375 miles
Life of battery plates (negative)	18,750 miles
Battery changes require	2½ minutes
Maintenance companies provide 1.9 batteries per car.	
Employees earn in plant, per hour	$0.11 to $0.19
Motor voltage	80
The maintenance company operating 450 batteries purchased 3,000,000 kilowatt hours @ $0.014	$42,000

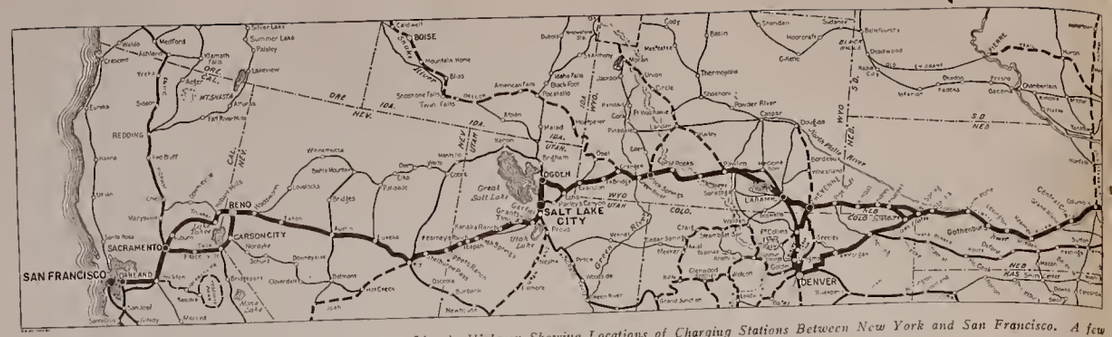
OFFICIAL GARAGE AND CHARGING STATION SIGNS.

The progress in placing the official signs with member garages and charging stations is not satisfactory to this committee. Our rental for the signs has been materially reduced but even this change has not stimulated this branch of our work.

As comparatively few signs of the present design are out and as we must soon place an order for an additional stock, this committee strongly recommends to the Executive Committee of the Association that some unique shape be



Curves Showing Reduction in Charging Rates of Philadelphia Electric Company.



Liucoln Highway Showing Locations of Charging Stations Between New York and San Francisco. A few

Garage and Rates Committee Report

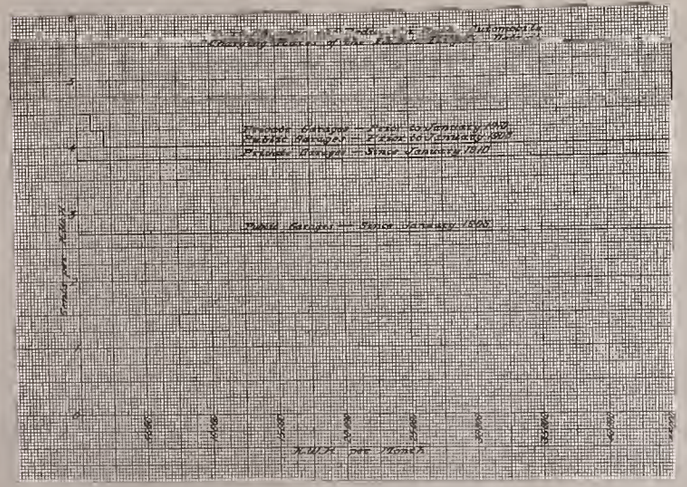
Presented to the Fifth Annual Convention

THE Garage and Rates Committee believes that it can best serve this Association at this time by starting to collect and compile data on facilities for electric vehicle charging outside of our larger centers of population. Beyond a doubt, carefully selected information properly recorded in the office of the executive secretary of the Association will be very valuable. The owner of a gasoline car has no thought as to where he will stop to replenish his supply of fuel, for he knows that gasoline can be had in every hamlet throughout the country, but not so with the driver of an electric car. On the contrary he knows that comparatively few places are provided with the proper charging facilities and his course must be carefully planned in advance with certain knowledge that he can get electricity in a form that he can use at predetermined places and these places cannot be chosen at random according to the population they boast of, or the hotels they support, but the route must be planned according to information secured in advance and, strange to say, it is not easily obtainable.

This committee before starting this work made a careful study of the undertaking and came to the conclusion that it must follow either one of two plans: (a) The selection of certain well traveled routes with cities at frequent intervals, or; (b) the development of the work by districts, as New York, Boston, Philadelphia and Chicago have done, and gradually adding thereto.

It is the opinion of this committee the better plan to follow is the development of the route plan, for it is evident that no one particular commercial interest would be willing to spend its money on this proposition. The work already done in the above mentioned cities shows that the central station interests are alive to the situation and can be relied upon to continue the development of the district plan for their own immediate interest.

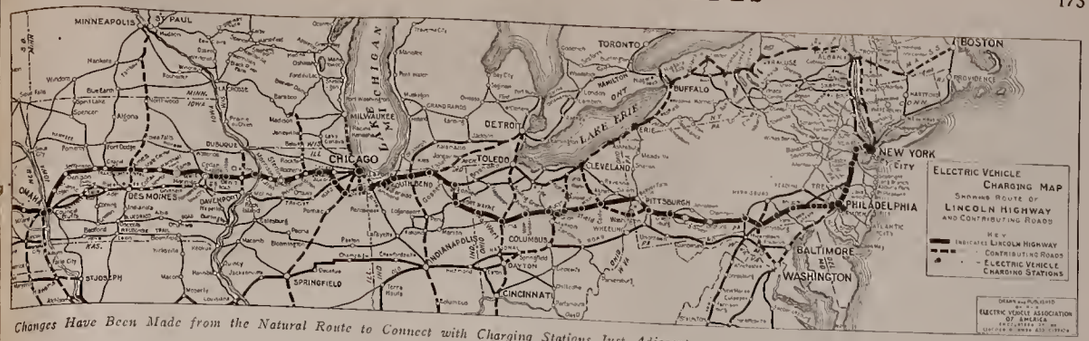
The committee has chosen for its initial effort, therefore, the collecting, compiling and publishing of the data obtainable regarding charging facilities along the route of the Lincoln Highway. The data collected is quite complete for the section between New York and the Mississippi River. The section west of the Mississippi River has been carefully canvassed and much data collected, but the committee feels that it is by no means complete. It is, however, probably of some value and is therefore published so that it may be preserved as a matter of association record.



Curves Showing Reduction in Charging Rates of Boston Edison Company.

Owing to the long distance between charging stations in certain localities, the committee has taken the liberty of slightly changing the route—notably as follows: Between Philadelphia and Lancaster, a charging point has been located at West Chester, which makes the stretch much easier and road conditions are also reported favorable. Between Pittsburgh and Canton, Ohio, the route has been shown by the way of Steubenville. This latter change is necessitated by the absence of all information regarding facilities in places between Pittsburgh and Canton via the official route of the Lincoln Highway. The road via this cutoff, according to the "Automobile Blue Book," is shorter and preferable to the Highway.

In explanation of the tabulation entitled "Lincoln Highway Charging Stations," the first column of figures represents the distance from New York City; the second column indicates the distance between charging stations. Where figures have been omitted in this column, we have been unable to find charging facilities. In the third column are the names of the cities through which the Lincoln Highway passes, which are reported in "McGraw's Electrical Directory" as having electric light plants, or sub-stations. It



Changes Have Been Made from the Natural Route to Connect with Charging Stations Just Adjacent.

will be noted that there are several long stretches between charging stations, the most serious one being from Chambersburg to Greenburg, a distance of 123.2 miles.

BATTERY SERVICE SYSTEMS.

Battery service is a live issue and the committee feels that this subject should be given special attention by the Association for the reason that if it proves commercially successful it can be relied upon to do more to stimulate the introduction of electric vehicles than any other means. It was to be hoped that we might have some late figures from the Hartford Company, but unfortunately they are not available. The Washington Water Power Company is operating a maintenance system in Spokane. M. C. Osborne, commercial agent of that company, advises that the system has not been in practical operation long enough to report definitely how successful it is. He seemed, however, very sanguine regarding the results to be expected. The rates for this service differ somewhat from those offered by the Hartford Company and are therefore given herewith. The chassis is sold by the Power Company with a universal battery cradle and a contract is entered into at the time of sale, for the battery service on the basis of a fixed charge, plus a mileage charge. These charges are shown in the table entitled "Complete Garaging, Including Battery Maintenance Service, Storage, Energy, Washing and Routine Adjustments."

E. W. Lloyd, general contract agent of the Commonwealth Edison Company, Chicago, brings a very interesting report of two battery maintenance system in Berlin:

One company has 700 vehicle batteries and another one 450, each of 150 ampere hours capacity. These two plants furnish the battery service for practically all of the 600 taxicabs in Berlin and a few private cars in addition.

These maintenance companies charge the taxi operators three cents per kilometer (nearly 5/8 mile) for battery service, including minor repairs to the car, but this does not include washing and garaging. The chauffeurs receive as their compensation 25 per cent of the fares plus all tips. The expense for washington the cap is 25 cents and one-half of this charge is taken out of percentage earned by the chauffeurs.

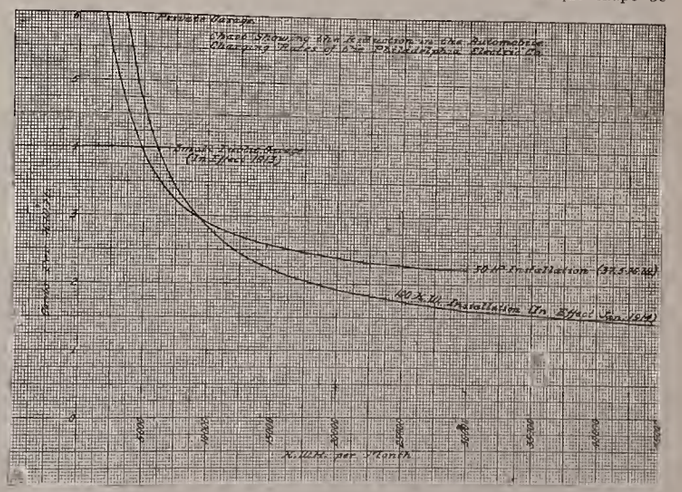
The chauffeurs of the taxicabs are required to come in at certain specified hours for change of batteries. This distributes the load and reduces the number of employees in the station to a minimum. When the cab comes in for a fresh battery the odometer reading is taken and collection is made of the chauffeur for the previous charge. When it is noted that a certain minimum mileage can not be secured from a charge the taxi is required to go to the shop for overhauling. This keeps the average consumption of electricity well down and is a suggestion to the American companies who have just started this character of enterprise, or contemplate doing so. At the charging stations the workmen are paid a premium when the battery plates show a life exceeding 10,000 kilometers. The business is conducted on a strictly cash basis and no chauffeur is allowed a second charge until the previous one is paid for. Following are some interesting facts in connection with these systems:

Number of taxicabs in Berlin, approximately	600
Cost of license—Electric taxi	$357.00
Gasoline taxi	$2,856.00
Taxi speed, maximum miles per hour	20
Watt hours per taxi per mile	560
Taxi income—average per mile	$0.16
Battery capacity, at 5-hour discharge rate	250 ampere hours
Number of cells in a battery	40
Life of battery plates (positive)	9,375 miles
Life of battery plates (negative)	18,750 miles
Battery changes require	2½ minutes
Maintenance companies provide 1.9 batteries per car.	
Employees earn in plant, per hour	$0.11 to $0.19
Motor voltage	80
The maintenance company operating 450 batteries purchased 3,000,000 kilowatt hours @ $0.014	$42,000

OFFICIAL GARAGE AND CHARGING STATION SIGNS.

The progress in placing the official signs with member garages and charging stations is not satisfactory to this committee. Our rental for the signs has been materially reduced but even this change has not stimulated this branch of our work.

As comparatively few signs of the present design are out and as we must soon place an order for an additional stock, this committee strongly recommends to the Executive Committee of the Association that some unique shape be



Curves Showing Reduction in Charging Rates of Philadelphia Electric Company.

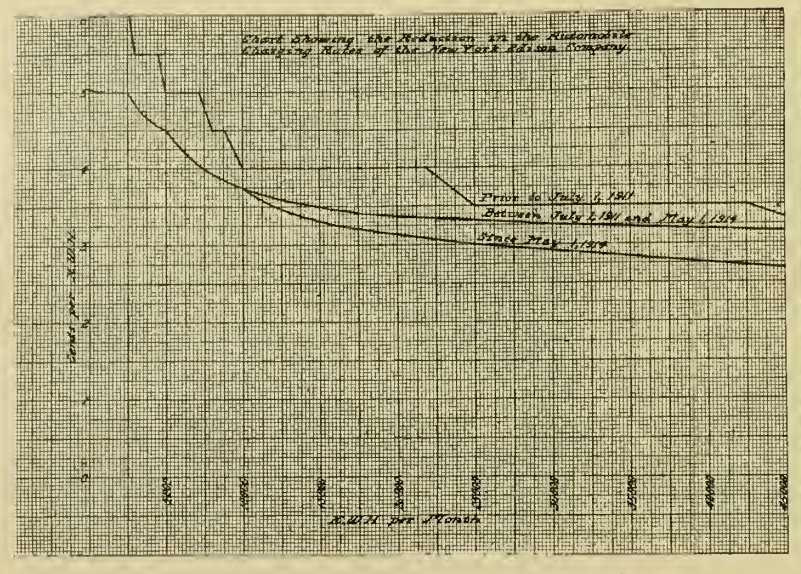
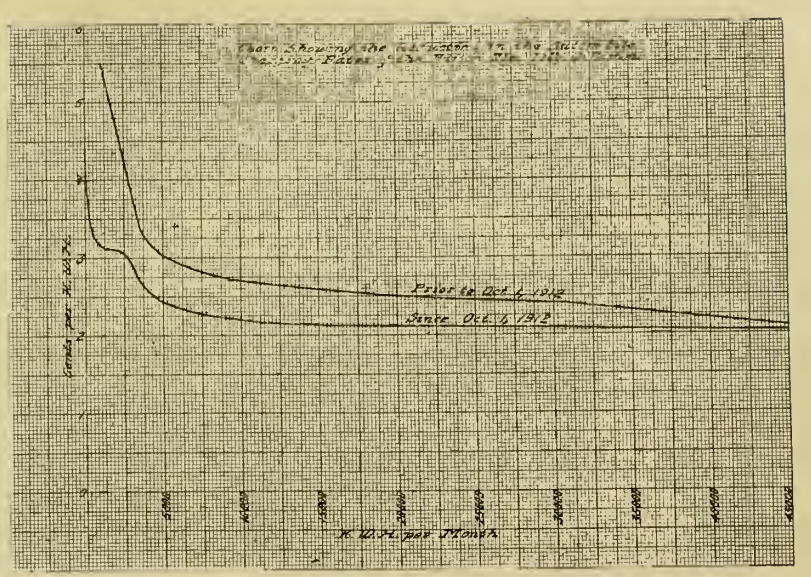
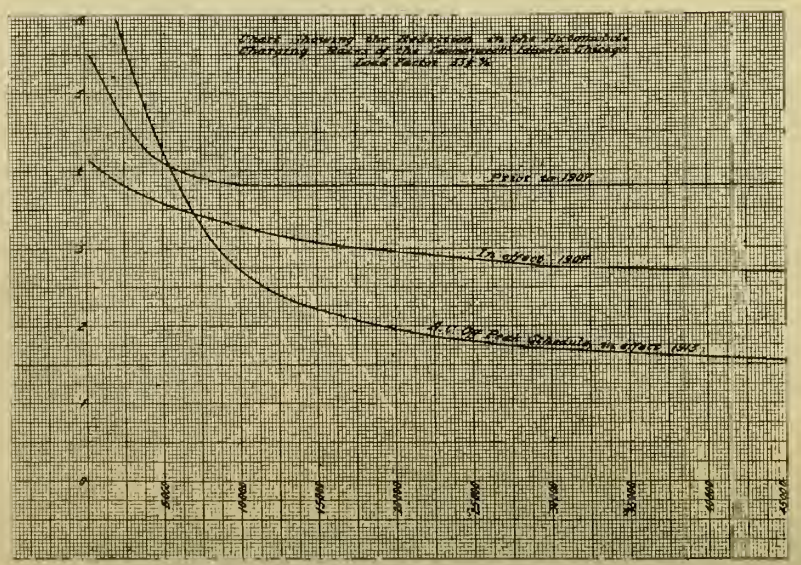


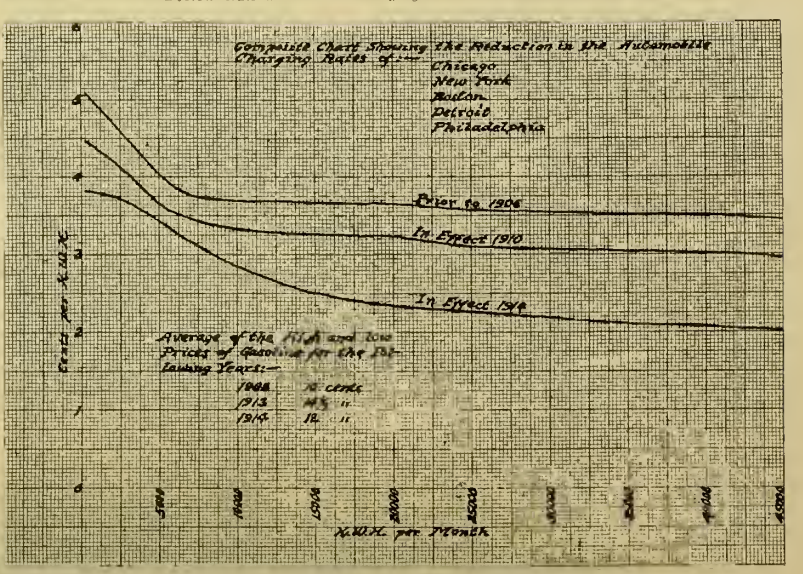
Chart Showing Reduction in Charging Rates of New York Edison Company.



Boston Edison Electric Charging Rates Reduction Curves.



Commonwealth Edison Company Curves Showing Reduction in Rates



Reduction in Charging Rates for Chicago, New York, Boston, Detroit and Philadelphia.

substituted with appropriate wording and coloring and that same be furnished to the garages and charging stations at a price sufficient only to reimburse the Association for the actual manufacturing and handling costs and put out under the same conditions as has been the practice heretofore, except that no rental is to be collected after the first year.

RATES.

The desire on the part of the central stations to keep pace with and encourage the increasing demand for the wholesale charging of electric vehicles is very clearly shown in the accompanying curves prepared by New York, Philadelphia, Boston, Detroit and Chicago, which show the reduction that has been made in the rates during the last eight years.

The curve shown on Plate No. 6 is a composite one made from the others and as a matter of general interest the committee secured the high and low price of gasoline back to 1908. The figures given on Plate No. 6 are the average between the high and low prices for 1908 and 1913 and 1914 prior to August 15. These figures are given to show the upward tendency of the price of this product as compared with the more favorable tendency of electric rates.—Respectfully submitted, J. F. Gilchrist, chairman; George B. Foster, secretary; W. S. Burch, Rochester, N. Y.; T. B. Entz, St. Louis, Mo.; E. M. Jackson, Denver, Col.; Harry Salvat, Chicago, Ill.; R. R. Young, Newark, N. J.; C. M. Marsh, Washington, D. C.; E. S. Mansfield, Boston, Mass.; C. H. Miles, Boston, Mass.; R. L. Lloyd, Philadelphia, Pa.; H. H. Smith, Orange, N. J.; S. G. Thompson, Jersey City, N J.; F. M. Tait, Dayton, Ohio; George H. Wood, Indianapolis, Ind.; J. A. Hunnewell, Lowell, Mass.; H. A. Campe, East Pittsburgh, Pa.; F. J. Stone, Boston, Mass.; George C. Holberton, San Francisco, Cal.; G. B. Kelly, Long Island City, N. Y.; J. W. Brennan, Detroit, Mich.; Adolph Hertz, New York City; Nathaniel Platt, New York City; W. G. Bee, Orange, N. J.; R. B. Grove, New York City. George H. Kelly, Cleveland, dissenting.

LINCOLN HIGHWAY CHARGING STATIONS.

Mileage Total	Mileage Intermediate	Places	Charging Stations	Address	Rate
0.0	....	New York City			
		New Jersey			
1.5	....	Jersey City	Crescent Garage	The Boulevard.	
10.6	9.1	Newark	Electric Vehicle Garage	123 Washington St.	6c per k. w. h.
15.0	5.9	Elizabeth	Elizabeth Automobile Co.	14-16 Westfield Ave.	10c per k. w. h.
67.5	51.0	Trenton	Brock's Garage	Canal St., at State	10c per k. w. h.
105.1	37.6	Camden	Camden Coke Co., Private Plant—Accommodation only.		
		Pennsylvania			
106.3	1.2	Philadelphia	Commercial Truck Co.	933 N. 27th St.	6c per k. w. h.
			Park Garage	2214 Spring Garden St.	6c per k. w. h.
			Bartletts Garage	21st St., above Market	6c per k. w. h.
		Philadelphia, West	Regent Garage	4536 Baltimore Ave.	6c per k. w. h.
122.9	16.6	Devon	Devon Garage		$2.00 per charge.
133.8	10.9	*West Chester	Chester County Garage	West Miner St.	
			Public Service Co.	Chestnut & Walnut Sts.	
172.1	38.3	Lancaster	Lancaster Automobile Co.	236 West King St.	8c per k. w. h.
196.1	24.0	York	Sommerville's Garage	116 East Market St.	75c-$1.00 per charge.
			Snyder Auto Co.	229 West Market St.	75c-$1.00 per charge.
			Leepers Auto Co.	120 North Howard Ave.	75c-$1.00 per charge.
225.0	28.9	Gettysburg	Gettysburg Light Co.		6c per k. w. h.
249.5	24.5	Chambersburg	Chambersburg Automobile Co.		$2.50 per charge.
305.1	....	Bedford.			
353.6	....	Ligonier.			
372.7	123.2	Greensburg	Westmoreland Motor Car Co.	E. Pittsburgh St.	$1.00 per charge.
405.0	32.3	Pittsburgh	East End Auto Co.	204 S. Beatty St.	$1.00 per charge.
			Morewood Garage	Center & Morewood Aves.	$1.00-$1.25 per charge.
			Pittsburgh Motor Service Co.	Liberty & 1st Sts.	
		Ohio			
446.0	41.0	*Steubenville	The Automobile & Motor Boat Co.		$1.00-$2.50 per charge.
506.9	60.9	Canton	Canton Electric Co.		
514.9	....	Massillon.			
545.0	38.1	Wooster	The Wooster Electric Co.		7½c per k. w. h. 4 to 10 p. m.
576.9	31.9	Mansfield	Mansfield Ry., Lt. & Pr. Co.		5c per k. w. h.
591.9	15.0	Galion	Galion Motor Car Co.	510 E. Main St.	
602.9	11.0	Bucyrus	Bucyrus Lt. & Pr. Co.	N. Sandusky Ave.	10c per k. w. h.
619.5	....	Upper Sandusky.			
668.3	65.4	Lima	Electric Service Station	132 N. Union St.	$2.00 per charge—night only.
697.3	29.0	Van Wert	The Van Wert Garage	Lincoln Way, East	$2.00 per charge.
		Indiana			
731.6	34.3	Fort Wayne	Electric Garage	Broadway & Washington St.	$1.50 per charge.
768.5	36.9	Ligonier	Lyon & Greenleaf.		
798.5	30.0	Elkhart	Brice H. Reid Co.	211 S. Main St.	$1.50 per charge.
815.9	17.4	South Bend	Lincoln Garage	288 S. Lafayette St.	$1.50-$1.75 per charge.
			Electric Garage	521 W. Washington St.	$1.50 per charge.
842.6	26.7	La Porte	O. S. Mondell	214 Pine Lake Ave.	Private—Accommodation.
			F. H. Morrsion	1217 Michigan Ave.	Private—Accommodation.
865.3	22.7	Valparaiso	Lincoln Highway Garage.		
		Illinois			
897.5	32.2	Chicago Heights	Public Service Co.	10 Illinois St.	10c per k. w. h.
		**Chicago	Commonwealth Edison Co.	10847 Michigan Ave.	5c per k. w. h.
			Fashion Automobile Station	740 E. 51st St., near Cottage Grove.	$1.50 per charge.
911.1	13.6	Joliet	Otto Specialty Co.	101 Van Buren St.	
			Joliet Motor Co.	504 Clinton St.	
			Lawrence Griffin Auto Co.	100 Cass St.	
934.8	23.7	Aurora	Downer Place Garage	70 Downer Place	$1.50 per charge.
			Aurora Garage	41-45 Downer Place	$1.50 per charge.
			Central Garage	66-70 LaSalle St.	10c per k. w. h.
968.3	33.5	DeKalb	Foiles Garage	1st & Main Sts.	10c per k. w. h.
1,011.8	43.5	Dixon	Illinois Northern Utilities Co.		$1.50 per charge.
		Iowa			
1,051.9	40.1	Clinton	Clinton Auto & Supply Co.		
			Model Auto Co.		
1,119.8	67.8	Lisbon	Wapsie Lt. & Pr. Co.		4c per k. w. h.
1,121.6	1.8	Mount Vernon	Wapsie Lt. & Pr. Co.		4c per k. w. h.
1,142.2	22.6	Cedar Rapids	Electric Motor Car Co.		
			Electric Storage Battery Co.		
			Parlor City Supply Co.		
1,192.5	....	Tama.			
1,253.0	110.8	Ames	Private Garage.		
1,430.2	177.2	Council Bluffs	Marion Auto Co.	612 S. Main St.	$1.00 per charge.
		Nebraska.			
1,435.0	4.8	Omaha.			
		Wyoming			
1,975.7	540.7	Cheyenne	Dildine Garage Co.	401 West 16th St.	8c per k. w. h.
2,031.3	55.6	Laramie	Central Garage		10c per k. w. h.
2,270.7	239.4	Rock Springs	U. P. Coal Co.		10c per k. w. h.
		Utah			
2,466.8	196.1	Ogden	Cheesman Auto Co.		
			L. H. Becroft Automobile Co.		
2,504.0	37.2	Salt Lake City	A. O. Whitmore	430 Brigham St.	
			4th East Electric Garage	26 S. 4th East St.	$1.00 per charge—30 cells. $1.50 per charge over 30 cells.

Mileage: Total	Mileage: Intermediate	Places	Charging Stations	Address	Rate
		Nevada			
3,131.9	....	Reno.			
		California			
3,294.8	780.8	Sacramento	P. R. Shipley	Up. Stock'n Rd. & Rose Ave.	$1.00 per charge.
			Graham & Lamus Co.	1217 7th St.	1625 Pacific Ave.
			Jas. F. Pipher	1910 M St.	$1.00 per charge.
3,416.9	122.1	Oakland	United Electric Vehicle Co.	3304 Telegraph Ave.	$1.25 per charge.
3,422.0	5.1	San Francisco	Guarantee Electric Garage	1625 Pacific Ave.	

*Not on Lincoln Highway. **Not on Lincoln Highway, 15.3 miles to Commonwealth Edison Co.'s charging station.

TRIBUTARY ROUTE VIA ALBANY, ROCHESTER, BUFFALO AND CLEVELAND.

0.0	....	New York City			
40.8	40.8	Peekskill	Ash's Garage	Washington St.	
72.5	31.7	Poughkeepsie	Edward A. Nelson	35 Market St.	
118.1	45.6	Catskill	Upper Hudson Elec. & R. R. Co.		
153.5	35.4	Albany.			
168.5	....	Schenectady.			
184.3	....	Amsterdam.			
195.0	....	Fonda.			
225.7	72.2	Little Falls	Electrical Supply Co.	Second St.	
248.5	22.8	Utica	Schiller & Cresswell	Noyes & Francis Sts.	
298.2	49.7	Syracuse	George P. Hill	119 W. Taylor St.	8c per k. w. h.
			Syracuse Storage Battery Co.	311 W. Willow St.	8c per k. w. h.
323.6	25.4	Auburn	Auburn Automobile Co.	54-60 Water St.	$1.00 per charge.
349.1	25.5	Geneva	Empire Gas & Elec. Co.		6c per k. w. h.
			Geneva Auto Co.		6c per k. w. h.
365.6	16.5	Canandaigua	Shay's Garage	34 Phoenix St.	10c per k. w. h.
395.1	29.5	Rochester	I. Lawrence Hill Co.	Cambridge & Park Aves.	$1.00 to $1.50 per charge.
			Park Avenue Garage	745 Park Ave.	$1.00 to $1.50 per charge.
			Shafer-Decker Co.	15 Circle St.	$1.00 to $1.50 per charge.
432.4	....	Batavia.			
471.0	75.9	Buffalo	Fred J. Berger	1204 Main St.	$1.00 to $1.50 per charge.
			Buffalo Elec. Vehicle Co.	1221 Main St.	$1.00 to $1.50 per charge.
			Buffalo Motor Vehicle Co.	178 W. Utica St.	$1.00 to $1.50 per charge.
477.0	....	Lackawanna.			
520.3	....	Fredonia.			
533.4	....	Westfield.			
		Pennsylvania			
548.7	77.7	North East	City Garage.		
563.8	15.1	Erie	Lambert Garage	716 Myrtle St.	
			Irwin Garage	513 French St.	
			Star Garage	609 French St.	
		Ohio			
593.9	....	Conneaut.			
607.6	43.8	Ashtabula	Municipal Lighting Plant.		
635.5	....	Painesville.			
664.8	57.2	Cleveland	The Fred Van Electric Co.	2021 E. 32d St.	
699.5	34.7	*Akron	The Baker Elec. Serv. Station.	22 Peterson Place	$1.00 per charge—40 cells.
722.6	23.1	*Canton	Canton Electric Co.		
689.5	....	Elyria.			
698.2	....	Oberlin.			
730.8	66.0	Ashland	The Ashland Auto Garage	East Main St.	7½c per k. w. h.
			Everybody's Garage	West Main St.	7c per k. w. h.
747.8	17.0	Mansfield	Mansfield Ry., Lt. & Pr. Co.		5c per k. w. h.

*Optional route to Lincoln Highway.

COMPLETE GARAGING, INCLUDING BATTERY MAINTENANCE SERVICE, STORAGE, ENERGY, WASHING AND ROUTINE ADJUSTMENTS.

Capacity of vehicle in pounds.	750	1,000	2,000	4,000	7,000	10,000
Fixed charge per car month	$35.00	$40.00	$42.50	$50.00	$60.00	$70.00
Rate per mile—						
First 500 each month 0- 500	.0275	.0300	.0350	.050	.060	.070
Next 250 each month 500- 750	.0225	.0250	.0300	.045	.055	.065
Next 250 each month 700-1,000	.0200	.0225	.0250	.040	.050	.060
All over 1,000 each month	.0175	.0200	.0225	.035	.045	.055

BATTERY SERVICE ONLY.

Capacity of vehicle in pounds.	750	1,000	2,000	4,000	7,000	10,000
Fixed charge per car month	$20.00	$25.00	$27.50	$35.00	$42.50	$50.00
Rate per mile—						
First 500 each month 0- 500	.0275	.0300	.0350	.050	.060	.070
Next 250 each month 500- 750	.0225	.0250	.0300	.045	.055	.065
Next 250 each month 750-1,000	.0200	.0225	.0250	.040	.050	.060
All over 1,000 miles each month	.0175	.0200	.0225	.035	.045	.055

Central Station Co-operation Committee Report

Presented to the Fifth Annual Convention

YOUR committee has undertaken to secure authoritative information as to the measure of co-operation that has been practiced between the central station companies and the electric vehicle manufacturers and selling agencies, in the past year, believing the ascertaining and publishing of the facts should constitute its first effort and should serve to promote increased and more efficient co-operation in the future.

As the ten members of the committee are located in the cities of Boston, New York, Philadelphia, Washington, Cincinnati, Chicago, St. Louis, New Orleans, Denver and San Francisco, it may be safely claimed that the information obtained is representative of the entire country.

The committee has carried on an extensive correspondence with central station companies and manufacturers, and has solicited a frank expression of views and opinions. The responses have been, in general, prompt and helpful.

As was expected, the central station companies have expressed a willingness to co-operate in every way practicable in promoting the use of electric vehicles.

Your committee is very glad to report also that, without a single exception, the manufacturers of electric vehicles have written, in response to the direct question, that the spirit of real co-operation has been more marked during the past year than ever before. While the opinions differ as to the measure of the increase in co-operation, there is no claim that conditions have not improved. Several of the manufacturers report that in their opinion there has been a distinct advance in co-operative effort.

One of the manufacturers classifies the present attitude of central station as in his judgment about as follows:

Those who aggressively promote sales by the exclusive use where possible of electric vehicles in their own business, and by advertising and other methods encourage their use by others.	10%
Those who passively assist in sales when requested or spasmodically show interest	50%
Those who make no effort either of their own initiative or when requested, but at the same time do not condemn the use of electrics	35%
Those who, from some remote past experience, actually preach against the use of electrics	5%

The foregoing classification is probably not much, if any, out of the way. It should be borne in mind, however, that the above percentages apply to the mere number of central stations rather than their relative importance in capitalization and earnings. It is probable that the 10 per cent in the first classification represents several times that percentage of the earning power and corresponding influence of the industry. It seems clear that if 60 per cent of the central station are actually doing something, however little, to push the electric vehicle business, the prospect of practical co-operation is at least encouraging, and if 10 per cent of the companies are now aggressively promoting the sale of electric vehicles, no further need be offered to prove the wisdom and benefit of active co-operation.

It is a fact that the central stations in several of the largest cities have been most active in campaigning for electric vehicle business. These companies generally propose to continue or increase this activity. Among those which have been especially active are the companies in New York, Chicago, Boston, Philadelphia, St. Louis, Washington, Cleveland, Newark, N. J., and Denver. These companies with others have made very large expenditures in directly promoting the sale of electric vehicles, relying upon the future development to yield returns which will justify their large outlays.

Reports of actual results are not available in all cases. As one instance, the Public Service Electric Company, of New Jersey, which now has seven active new business men in its automobile department, reports that in 1912 the current consumption for battery charging increased 50 per cent over that in 1911; in 1913, 87 per cent over that in 1912; and that the first eight months of 1914 yielded 150 per cent of the total business of the year 1913.

Also, the New York Edison Company reports that during the year 1913, four hundred and seventy-nine new electrics were added to the number already operating in its territory, and that the sale of current for charging purposes was increased by 1,500,000 kilowatt hours.

Some of the large companies claim that their efforts have not been reinforced by the manufacturers to the extent expected, but that on the contrary some of the manufacturers are inclined to rely upon the work of the central stations entirely in such territories and take advantage of such favorable conditions to devote their own energies to other localities where the central stations are not so active. In effect, it is suggested that the activities of the manufacturers' selling forces are applied in the inverse ratio of those of the central stations.

Contrariwise, the committee has been informed of instances where the central station company, in purchasing electric vehicles for its own use, has slighted the particular make of car represented actively in its own city, evidently because of preference for some other type of car not locally represented.

Such cases, while probably explainable, do not recognize or promote the spirit of co-operation.

In the mass of correspondence received by the committee there are various other well-intended criticisms from both sides, which in general seem quite reasonable from the respective viewpoints. A repetition of these criticisms could hardly answer a good purpose at this time. The committee hopes and believes that such instances are accounted for mostly by the personal equation and that they will become less and less as practical plans of co-operation lead to closer acquaintance and mutual understanding.

Probably the quickest and most effective means of promoting real co-operation is to have a local organization as a medium of direct and intimate relationship between the central station and all others interested in the sale and maintenance of electric vehicles in each city or given territory. This should preferably take the form of a local section of this Association. Nothing will so stimulate a true spirit of co-operation as associated effort in devising plans and methods for producing results. Your committee urges that this be undertaken promptly and energetically in every city of sufficient size to justify the organization of a local section. Shoulder to shoulder effort along definite lines will not only avoid misunderstandings, but will produce effective co-operative results. It is suggested that special effort be made next year to increase the number of successful local sections throughout the country.

One point upon which all the manufacturers agree is that the most practical and helpful plan of co-operation which the central station companies themselves can adopt at once is the securing and maintaining of adequate garaging facilities. This seems to be the one thing essential to promoting electric vehicle sales, and it is definitely urged that the central stations, where necessary, maintain garages of their own where electric vehicles of all types will receive equal attention and care. Believing this recommendation (which has come from several of the manufacturers) worthy of special attention, we quote the following extracts of a letter, which is typical of others, and which expresses the viewpoint clearly:

"The lighting company can back a good garage without in any way advancing the interests of one manufacturer against another, and it can help the sales of electrics by insuring customers of good attention. 'Service' at one time meant free repairs. It is beginning to mean good facility for repair, for which the customer must pay, as indeed in the long run he does for all 'free' repairs.

"Service now above all is what is needed by the electric car, whether commercial or pleasure. And that service is needed by the electric car in less quantity than the gas car needs it, but it needs it just as surely, and in some respects the service must be of a higher grade since electricity and batteries are something which the mechanic and the customer do not readily grasp.

"We all know if a car is properly charged and the batteries receive the minor attention which they need, but unfortunately without which they will continue to run, an electric car can be depended upon absolutely to do its good service. For this reason, we emphasize the need of a good substantial and reliable garage in every city. Wherever there are such garages, the business is excellent. Where there are no garages even though other conditions seem favorable, it is poor. This is said in spite of the fact that so many people keep their cars at home and charge by rectifier or generator.

"Such people do not usually like to equalize their battery or do anything but put the car on charge and take it off. A service which will permit the customer to bring his car once in three or four months for inspection and equalizing will wonderfully add to the life of the batteries and satisfactory use of the car.

"In many cities it is difficult to get private capital to invest in a satisfactory garage. If the central station would start such a garage it would find that it could be run at a profit and later turned over to some individual.

"The manufacturers cannot start garages themselves all over the country, but they can, we think, rightfully look to the central station to see that local service and garage is offered to the user of any make of electric car. Such a plan will bring returns to the central station in point of current profitably sold as great or greater we believe than any one line of investment which they now follow."

The committee is in sympathy with these views and commends them to the favorable consideration of the central stations.

The question of rates charged for current naturally arises in any discussion of co-operation between the central stations and the manufacturers. As this point has not been emphasized in the correspondence, your committee assumes that the central stations have already, to a large extent, satisfied themselves and their friends, the manufacturers, on this point.

It is obvious that favorable rates for current will assist in making sales, and hasten the development of the electric vehicle business, and it is recommended that this fact be borne in mind by the central stations.

By way of showing the particular methods followed in some of the larger cities, the reports received from several companies are printed as an appendix.—W. W. Freeman, Cincinnati, chairman. W. H. Atkins, Boston; L. A. Coleman, New York; W. H. Johnson, Philadelphia; E. S. Marlow, Washington; Louis A. Ferguson, Chicago; A. C. Einstein, St. Louis; M. S. Sloan, New Orleans; Clare N. Stannard, Denver; G. C. Holberton, San Francisco, Committee on Central Station Cooperation.

APPENDIX.—SPECIAL REPORTS OF CENTRAL STATION COOPERATION.

Commonwealth Edison Company, Chicago, Ill.—The company has always looked with great favor on the electric as a very valuable field for central station service and has endeavored to build up this class of business. The work being done by it may be classified under the following general heads:

1st. General publicity.
2nd. Favorable rates for electricity for charging batteries.
3rd. Personal services of specialists available to users of electric vehicles.
4th. Inspection of garages and equipment.
5th. Maintenance of emergency charging and boosting stations.

The subject of electric vehicles has received a great deal of attention in our *Electric City* magazine not only in the matter of articles appearing from time to time on this subject, but in a number of cases practically the entire issue has been devoted to the electric vehicle propaganda.

The company has used to advantage other mediums for advertising this business, among which may be mentioned special insertions in such trade magazines as the *Power Wagon*, ELECTRIC VEHICLES, *Garage Efficiency*, and by means of advertisements from time to time in the daily papers.

We have proceeded on the theory that the best interests of the electric vehicle can be served by encouraging the building up of large garages which can afford to retain the competent help required. We, therefore, worked out an "off-peak" schedule applying to installations having a maximum demand of 50 kilowatts or above, which brings the rate for electricity, used by the larger garages, handling from 75 to 150 cars each, down to from 1¾ cent to 2 cents per kilowatt hour. This has enabled us to take over practically all the vehicle charging business in Chicago, as evidenced by the fact that over 85 of all the charging in the city is done from our circuits. We hope to sign contracts with the remaining garages before the end of the year.

We are convinced of the fact that the successful operation of electric vehicles depends very largely upon the daily care given them. We have therefore devoted a great deal of attention to the bettering of operating conditions. We have advertised the fact that we retain specialists who are at the service of vehicle users for advice, etc., and the public frequently avails itself of this privilege.

Our representatives periodically visit all the large garages and thus keep in close touch with the operating conditions. They advise with the garage owners and give them the experience of the observations they make in the various garages of the city.

A special man is assigned to handle calls from mercury arc rectifier customers, and the necessary minor repairs on this apparatus are made at the company's expense.

We have equipped twenty-one of our sub-stations with apparatus for this work. This equipment generally consists of mercury arc rectifiers but in a number of the outlying districts, located in widely separated parts of the city, we have installed motor-generator sets of ample capacity to give 200 ampere boosting charge to electric trucks. This has been of material service in a number of instances and is appreciated by vehicle owners.

In the way of future activity, a number of plans have been suggested for adoption by central station companies. One is that of cooperative advertising whereby vehicle agencies and the central station combine in the various localities to carry on an advertising campaign. The object would be to strongly emphasize the many advantages of the electric vehicle instead of dwelling on special features of the various cars, as is now the case where each vehicle manufacturer does his own advertising.

Another plan adopted by one company is the paying of commissions to those of its representatives who are instrumental in the selling of electric vehicles. This appears to be a very good idea.

Before, however, any extensive campaign is entered into for the sale of commercial trucks to small users much better garaging facilities than now exist must be provided. This in our opinion is very essential and we believe it will be a serious mistake to stimulate the sale of trucks to individuals until means are provided for taking care of them properly.

The New York Edison Company, New York.—Four years ago the New York Edison Company established its automobile bureau, and the man placed in charge was instructed that his duty was to cooperate in every way possible with the electric vehicle manufacturers who were selling in New York territory.

After the bureau became acquainted with all local electric vehicle selling agencies, it set about the task of getting in touch with all local users of electrics. A list of all New York City automobile registrations was obtained from the secretary of state, the electric vehicle owners selected therefrom, and listed on cards. A list of customers taking service from the company for charging purposes was next obtained. Calls were then made on all persons whose names appeared on either list, the preliminary record was checked, and a permanent record established. This record is kept on cards which show the name of the owner of the car and his address, the make of the car, where it is garaged and the source of the charging current, whether Edison service or a private plant.

This list of vehicle owners is kept up-to-date by daily reports from the state automobile registration bureau, and whenever a new registration appears the car owner is interviewed, the purpose of the automobile bureau explained and its services offered. The bureau aims to keep in touch with the operation of every electric in the city and, whenever possible, performance and cost data is obtained. A call is made at least once annually on every user in the city.

Owners of cars, and electric vehicle manufacturers were advised by letter that the company had established an automobile bureau, and stood ready to assist in the care and operation of electric vehicles.

The next very important step was the establishment by the company of twenty-two two outlet charging stations throughout the city. This network of emergency charging stations covers the city very completely, and it never happens that a vehicle wanting a boost is a too great distance from a supply of charging current.

A booklet containing a list of all garages and charging stations within a radius of 100 miles of New York City is published annually by the company, and given wide distribution. Electric vehicle and storage battery manufacturers are advised that they may have as many copies as they may want for their own mailing lists or for their showrooms.

The automobile bureau of the New York Edison Company is now composed of eight people, one of the number being a lady demonstrator, making demonstrations and giving driving lessons in any of the cars offered for sale in the city.

One of our men is an office engineer, who collects and compiles statistics and all performance and cost data he can get hold of. He supplies engineering advice to our service man, and our salesmen, at times going out on special cases himself.

If the electric vehicle purchaser will permit, the bureau will direct the installation of the necessary garage apparatus and give advice as to proper maintenance of the vehicle. If the purchaser does not wish to care for the car himself, he is supplied with a list of nearby garages where satisfactory service may be obtained. In this manner the service of the bureau is two-fold: first, by arranging garaging facilities for the new car, and, secondly, by increasing the business of the garage man who is trying to earn a lower rate.

Another duty of the bureau is to select and maintain a list of New York business houses now using horse-drawn vehicles, but whose volume of business handled seems to warrant the adoption of a more economical mode of transfer. This list is circulated at intervals and attention is drawn to the advantages to be derived from the use of electric trucks. A reply to one of the letters being received, a representative immediately calls and determines the requirements of the case, submitting interesting performance data, and figures on cost of operating and maintenance. He also has with him a list of satisfied users of electric vehicles. With the prospective purchaser's permission his name is sent by letter to the local representatives of the different electric vehicle manufacturers, with the request that descriptive literature be sent and followed by a salesman. The automobile bureau becomes acquainted with the salesmen on the case and keeps in touch with the progress made, giving information where it is wanted on the cost of charging current and the necessary charging apparatus.

The company spends a goodly part of its advertising appropriation on electric vehicle publicity. Space is purchased in both newspapers and magazines, and each advertisement carries the names and addresses of all electric vehicle selling agencies in the city. Copies of our advertisements are always sent to vehicle manufacturers, irrespective of whether they are represented in the city or not. It is interesting to note that two years ago there were but eight or nine manufacturers represented in New York while at the present writing there are twenty-one agencies or branches.

The United Electric Light & Power Company, New York.—The following will state briefly the activity of the United Company rendering cooperation to the E. V. A. A. and electric vehicle industry.

Coincident with the election of Frank W. Smith as president of the E. V. A. A., an electric vehicle bureau was organized by the sales department of this company. This followed the suggestions and recommendation made in a paper by George H. Kelly, vice-president of the Baker Motor Vehicle Company of Cleveland, read at the fourth annual meeting of the Association.

The object of the vehicle bureau is to cooperate in a broader sense with the electric vehicle interests in the city and in the surrounding neighborhood towards the sale and use of electric vehicles. We endeavor to supply information of this and kindred nature to those inquiring and to have it in readiness for such uses as may arise from time to time. The co-operation mentioned includes looking out for means of assisting the opening of garages and the application of electric vehicles and transportation service in any of its forms. Under this head may be mentioned the opening of the new garage of the Exide Battery Depots, Inc., 527 West 23rd street, capable of handling one hundred electric vehicles. It is probably the largest public garage of its kind. For approximately one week this company ran ads, three column, nine inch, in the leading daily papers, advising the public of the establishment.

From time to time application has been made by a franchise committee to the board of aldermen for franchise to operate

electric buses over certain streets of the city. At public hearings at which those interested and competent to speak attended, the number has included representatives of this company. Assistance and information has been furnished along the same lines, tests and other demonstrations.

This company has utilized the electric vehicle in advertising its merchandising campaign. The instance of the vacuum cleaner is referred to.

The company has co-operated and assisted at the various meetings of the E. V. A. and has endeavored to secure the attendance and assistance of all those interested in the electric vehicle industry in promoting this mutual movement. At kindred meetings and outings, the company has been represented.

The advertising in the daily press has been referred to above. The company also distributes small booklets calling attention to the value and availability of the electric vehicle. At the present time a stiff card, giving a list of the charging stations in the metropolitan district is in course of preparation for distribution to the operators of electric vehicles so that no driver need remain in ignorance of the exact location and capacity of any charging or boosting station to which he may have recourse.

For further evidence of the United Company's spirit of co-operation, reference may be had to the fact that eight members of the company are members of the E. V. A. A. and practically each one is a member of at least one committee, and the fact that our worthy vice-president is the president of the Association, while our sales manager has directed the boosting of the membership to over double in the past year.

On May 1 of this year a reduction in the automobile, storage battery and refrigeration rate was announced which will mark a distinct advance in the use of current for this purpose following the more general introduction of the electric vehicle.

The Union Electric Light & Power Company, St. Louis, Mo.—At the close of 1906 there was but seventeen electric pleasure cars in St. Louis, one gasoline garage was attempting to charge electrics and about ten rectifiers were in operation. The electric was being given but scant attention by men entirely ignorant of the article they were handling.

With the beginning of the following year our company decided to develop the field and went about it in the following manner.

1st. The automobile department with the man in charge reported direct to the general manager was instituted.

2nd. A garage with a capacity of about eighty cars was erected and equipped with all modern appliances. The outlay here was approximately $50,000.

3rd. An efficient garage and selling force was recruited.

4th. A comprehensive educational and advertising campaign was begun. It is noteworthy that during the first year a sum of money easily equivalent to the total market value of all electric pleasure cars then in the city was spent for this purpose.

5th. The local agency for two makes of cars was taken and an active campaign started.

Our efforts met with immediate success and during the first year we sold about twenty-five cars.

The records show that on January 30, 1910, there were 350 electric cars in the city. Thirteen manufacturers were represented by local agents, eight public garages were caring for electrics, four of these being for electrics exclusively, and forty-seven rectifiers were in use.

We remained actively in the pleasure car business until January 1, 1913, when we retired from the field, closing our garage which, at that time, was full to overflowing, and in this manner fulfilling our promise not to remain as an active agent once the field was developed.

Prior to discontinuing our pleasure car activities we opened a splendid electric truck garage immediately adjacent to the wholesale business section of the city and started to actively push this business along the same general lines that had proven so successful in the pleasure car field, but here we found a lack of confidence on the part of the manufacturer that had been entirely absent in our dealings with the pleasure car men.

The majority of pleasure car agencies established in the city operated from and kept their demonstrators at our garage until such time as their finances enabled them to open their own place.

When we opened our truck garage we issued a book of photographs and sent invitations to all manufacturers to house their demonstrators with us. This invitation was not taken advantage of.

No material improvement in conditions was noted and during the year 1913 we closed our commercial garage to the public and since that time have used it for our own vehicles exclusively. To sum up, we will say that there is absolutely no question that the Union Electric Light & Power Company has shown a spirit of co-operation which is surpassed in no city in the Union. This company has spent as much if not more real money in furthering the electric vehicle business than has any other central station. We have spent liberal sums for local and national advertising, for an excellent fleet to be used in our own business, in addition to the money invested in two public garages. In spite of this the commercial vehicle manufacturers have not sold the goods and we feel that the efforts put forth to do so are in no way commensurate with the work done by us.

The Denver Gas & Electric Light Company, Denver, Colo.—For a number of years we have done everything in our power to develop the electric vehicle business, both along pleasure and commercial lines, resulting in our having on our lines about 1,000 pleasure vehicles and in the neighborhood of seventy-five trucks, which are in operation, charged regularly and bring us a good revenue.

Our company maintains an electric vehicle department with an electric vehicle engineer in charge, who assists local agents in selling both classes of machines (his services being available to the public in an advisory way), examines free of charge machines and batteries and recommends improvements and co-operates in every way with vehicle owners, local agents and manufacturers. In turn, the manufacturers and dealers have frequently assisted us in various ways.

In a number of instances the manufacturers have sent to Denver demonstration cars, and frequently we have co-operated through furnishing garage room, charging and a man to demonstrate such trucks.

From the above will be observed so far as Denver is concerned the manufacturers and central station have very liberally supported one another. Our company has been very liberal in advertising electric vehicles through the newspapers and other channels of publicity.

The Public Service Electric Company, Newark, N. J.—This company maintains an automobile department whose efforts are devoted exclusively to the promotion of the use of these machines. This department is now entering its fourth year of operation, and its existence has been justified by the work accomplished in the past.

Its methods of operation are to influence prospective users of vehicles to consider the electric and to co-operate with the manufacturers in effecting sales of these machines. We maintain an inspection department which periodically examines all machines on our lines, reporting on their condition to the user, to the manufacturer, and to our own organization.

In our automobile department are men employed competent to pass judgment on the application of machines and to adjust difficulties arising in their operation.

We have seven men active in the new business field in developing the use of these machines, who report direct to our automobile department. As indicative of the results obtained, in 1912, our current consumption increased 50 per cent over that of 1911; in 1913, 87 per cent over that of 1912; and in 1913, 182 per cent over 1911. To date the business for 1914 is 150 per cent of the total business of 1913.

The Philadelphia Electric Company, Philadelphia, Pa.—The Philadelphia Electric Company has set an example in using electric trucks, having now in service forty-two. Also two electric runabouts are used by heads of departments. Low rates have been offered for this class of service and a commission discount from this special rate is offered to garages who agree to serve the public in the same liberal manner. We do considerable advertising, both in the newspapers and by booklets, folders, etc. An electric vehicle division has been established in the new business department and all inquiries and some special solicitation is handled there. An inspection service is handled by our experts who look after our own cars, and complaints from vehicle users receive attention by this department. Co-operation has been established with agents of the several makes of cars and prospective buyers referred to them. The net result has been the continued growth and popularity of the electric vehicles in this territory.

Ask Mortgage Set Aside

H. F. Lamphere, trustee of the Grinnell Vehicle Co., which recently went bankrupt, has brought suit in the federal court asking that a mortgage given by Miles C. Parrish and Charles G. Hodgson to the Merchants National bank be set aside. Parish and Hodgdon are alleged to have executed a mortgage for $50,000 on certain lands to secure the payment of a $17,000 loan from the bank at a time when their firm was insolvent.

Touring for Pleasure Not Records

Borland Roadster Journeys 264 Miles from Philadelphia to Cape May and Return

IN the last few years it has been a quite frequent habit of electric vehicle manufacturers and their distributors to promote long distant tours or cross country runs. These trips to a great extent have been tests promoted purely for reasons of securing absolute record of the ability of their new models and probably more so in securing the world wide publicity which is accepted as exceedingly valuable in obtaining popularity for electric battery propelled cars and especially for the individual type making the run.

In practically every instance of previously published reports the complete knowledge of roads to be traversed and a vehicle built especially for such tests were first obtained before such test runs were attempted. Under these conditions and with the assistance of an expert driver practically all of these runs have proven to be successful.

Many manufacturers differ on the diplomacy and actual value of such test runs in that they cause many to believe and rely on any electric of the particular make to be capable of making similar records. Often purchasers are misled by such performances although bona fide. After finding they are unable to secure similar results, as should naturally be expected, they complain that their vehicle does not comply with the ability displayed by other vehicles of the same type. Consequently they assume that they have purchased a car of inferior quality and are somewhat disappointed.

In order to avoid this misconception, many manufacturers have refused to make public the actual mileage per charge or even the details of various test trips which through a perfect knowledge of their vehicle and the skill of an expert driver they have been able to make.

It is taken for granted that in general the electric is not a touring car, yet it is quite obvious that the roadster type is capable of successfully covering certain long distances under proper conditions.

Electric touring, however, is not entirely restricted to manufacturers. Tours in electrics have many advantages, especially where uninterested owners voluntarily make such runs more as a necessary journey than for the purpose of "pulling a publicity stunt."

The following account is of interest, in that it was made by a disinterested owner who found it necessary to make a trip for other purposes than in search of getting a test record:

Mr. and Mrs. Ralph H. Bobb of Philadelphia, recently decided to take a trip in their Borland electric roadster from Philadelphia to the sea-shore resorts of New Jersey and return.

The roadster was equipped with 42 cells of 11 M V Hycap Exide, the regular battery equipment, and in addition to the passengers, considerable luggage was carried. The total distance travelled was 264 miles. The car was charged twice on the trip, and the average mileage per charge was 88 miles.

A detailed log of the trip follows:

On Wednesday the roadster left Philadelphia with a full charge and arrived in Atlantic City. Owing to taking the wrong road out of Camden, about seven additional miles were covered over very bad roads, in getting back to the White Horse Pike at Magnolia.

On Thursday the original charge was found to be ample for considerable running around in Atlantic City. The car registered on original charge 91.5 miles. The car was put on charge Thursday night; its first charge of the trip.

Friday, a run was made from Atlantic City to Ocean City; 17 miles in 50 minutes, a running speed of 20.4 miles per hour. After a stop at Ocean City, a run was made to Wildwood, where a stop was made over night.

On Saturday, still on the first charge enroute, car left Wildwood for Cape May with three passengers instead of two passengers. Considerable mileage was covered around Cape May, and a return made to Wildwood.

Sunday morning the car was used in running around Wildwood, and in the evening registered 82.4 miles, when it was put on charge; the second charge enroute.

Monday the car left Wildwood for Philadelphia, and made the run straight through, making the trip with a short stop enroute, in the total elapsed time of six hours and 35 minutes; the odometer showing 90.2 miles for this charge.

Mr. Bobb writing to the manufacturers in giving particulars of this trip states:

"It may be interesting to you to know that I made the trip in our electric roadster from Philadelphia to the sea-shore resorts of Atlantic City, Ocean City, Wildwood and Cape May and return, in company with Mrs. Bobb, and with considerable luggage, and with the exception of one tire blow-out, had not the slightest trouble. During all of the trip, there were at least two pasengers in the car; during a portion of the trip a third passenger; and during all the trip between the resorts we carried 75 pounds of luggage. We were very well pleased with the way our electric performed on this tour."

While electric car performances such as the above are known by those acquainted with the possibilities of electric vehicles, too often those not familiar with the latest developments in electric cars, do not give them credit for the thoroughness with which they satisfy requirements for suburban use.

Had there been any desire on this trip to increase the mileage per charge with its regular equipment, it would have been possible, but the trip was not made with a view of making a record run. It was purely an instance of a disinterested owner taking a trip for the sake of the trip; not for a record.

ELECTRIC VEHICLES

Published Monthly by

ELECTRICITY MAGAZINE CORPORATION

Monadnock Building, Chicago

Telephones: Harrison 3014—Automatic 61028

New York Office, 1022 Longacre Building, 42nd Street and Broadway.

Ed. J. Mock and Paul H. Woodruff, Editors

Fred B. Schafer, Associate Editor.

Allen L. Haase, Advertising Manager

Entered as second-class matter January 22, 1912, at the postoffice at Chicago, Illinois, under act of March 3, 1879.

TERMS OF SUBSCRIPTION

United States, Cuba and Mexico	Per year,	$1.50
Canada	Per year,	1.75
Foreign countries within the Postal Union	Per year,	2.00
Single copy		.15

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office of publication not less than ten days in advance of date of issue. Regular date of issue, the first day of each month. New advertisements will he accepted up to within five days of date of issue, hut proof of such advertisements can not he shown in advance of publication.

NOTICE TO SUBSCRIBERS

Remittances—Remittances should he made hy check, New York draft or money order, in favor of Electric Vehicles. Foreign subscriptions may he remitted direct hy International Postal Money Order.

Change of Address—The old address should he given as well as the new, and notice should he received two weeks in advance of the desired change.

This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in Electric Vehicles *or any voice in its management or policy.*

CHICAGO, NOVEMBER, 1914

TABLE OF CONTENTS.

THE LOW-PRICED CAR AGAIN.

CENTRAL station men and electric vehicle manufacturers can always find grounds for differences of opinion. At the recent convention the question of low priced cars was the one most disputed. The oft-quoted words of Steinmetz, Edison, Ford, et al, in advocacy of a cheap car have convinced more central station men than they have manufacturers. The latter, indeed, claim that there is no demand for a cheap car and no objection by buyers to present prices. The last argument is not especially persuasive, however, because of the comparative paucity of such buyers at best.

Nevertheless, the manufacturers appear to have history on their side. The acceptable electric passenger vehicle seems to have a value which lies inside of certain well defined limits. It is true that low priced cars have been placed on the market from time to time without creating any furore. It is also worth noting that more than one manufacturer has tried the other extreme, a model selling at five thousand dollars or more. We have seen no reports signifying that these high priced cars have supplied any long-felt want.

With only one or two exceptions, and they not far outside the charmed circle, the whole electric passenger car field is included within a radius of five hundred dollars one way or the other from the three-thousand-dollar mark. Putting the total of such vehicles in use at 40,000, for round numbers, are we then to assume that the other possible million customers are not interested in electrics at *any* price? Are both the Ford-Dodge and the Pierce-Stearns-Locomobile-Stevens-etc. classes of buyers hopelessly lost to the electric trade?

We cannot but respect the present manufacturers' defense of their prices and values. From an organization viewpoint their stand is absolutely right. It is just as big a mistake to ask them to market, or even approve, a cheap car as it would be to ask Harry B. Joy to put through designs for a five-hundred-dollar Packard. In short, it can't be done.

But what the manufacturers must recognize is that a cheap electric, desirable or not from their standpoint, is inevitable. The mystery is why they should manifest a tendency to fight it. A successful cheap car would give the whole industry the most vigorous forward impulse it ever had. A five hundred dollar electric (imagining such a car physically possible) would not only double the sale of three thousand dollar cars, but would actually create a class of buyers for five thousand dollar cars.

Of the truth of this postulate we are absolutely convinced; but we are aware, of course, that not all our readers will agree with us. Indeed, it is reported that some of the present manufacturers intend to take active steps to discourage the cheap car. We cannot doubt that their motive is sincere; for no doubt they believe, and rightly, that a flood of cheap cars, flimsily constructed and unsatisfactory in operation, would discredit the whole electric vehicle industry, and destroy some of the business that has already been painstakingly built up.

But there is little real danger on that score. No cheap electric will be marketed on a large scale by any manufacturer not thoroughly equipped to handle it properly. That a manufacturer so equipped will shortly produce such a vehicle is however quite assured and it will get the support of all the entire stations; and we fear the attempts to discount the plan will have little ultimate effect.

All this argument, of course, is about the passenger electric. The light, cheap commercial vehicle needs no advocate. Every neighborhood grocer and milkman is a vital, if unconscious, argument for it.

CONVENTION BENEFITS.

MOST industries spend considerable time and money each year in holding conventions. Many wonder why. Some absolutely refuse to drop their business for a single week in order to attend. Others refuse to spend the necessary money. Then again there is that class of enthusiasts who attend for the personal pleasure of the event; some are forced to represent their firms and product in order to show up well with any prospects who may be in a happy enough mood to grant them a little new or additional business; and still others are sincerely interested and actually do attain a broader view and a clearer conception of the industry in which they perform.

At any rate the convention has been staged and many registered, each with his respective purpose; by some the same old reasons why we "should or shouldn't" are entirely unheeded; by others these suggestions, complaints or defective methods are made note of, carefully considered remedies submitted, and a new and better policy inaugurated. In nine out of ten cases these very suggestions and their discussions apply in some way to obstacles met daily and usually appeal to the individual interests of each registrant. Convention squabbles and discussions often clear up many problems and experiences of the year before. These together with the new developments suggest new plans and policies resulting in dollars-and-cents value.

Thus the annual convention, the get-together feature and the closer relationship of allied interests has solved many a problem. Stagnant business tactics have been automatically enlivened by this broader experience and the uninitiated have learned a better gospel and a more modern way of transmitting it to their clientele. To the sincere, the convention has given new ideas, a new message and a better understanding of each one's particular problem as it exists. The industry as a whole is generally benefited. If you did not attend yourself or did not send a representative who was a live wire, you lost the benefit of a year's experience, the successes and failures revealed during convention days by your competitors and prospects.

IN THE DISTANT FUTURE.

WE know that the future of the electric vehicle depends upon the future of the battery. And when we say that we mean storage battery—lead or nickel-iron because lead started the storage battery in business and nickel-iron is lead's only competitor. Even in our occasional long looks ahead few of us think of any other combination, because just now there is no other. Yet it is only reasonable to suppose that time and ingenuity will develop other portable means of generating current. And the vehicle would still be an electric if it were driven by a primary battery or a thermo-pile.

The primary battery came to life long before the secondary battery was made useful. Today we think of the primary battery as a highly extravagant but quite convenient method of supplying current for door-bells and gas car ignition. Yet even there it is being superseded by miniature transformers and small storage batteries. The field of the primary cell is narrowing. It has not made progress with its younger rival. Wherever it is possible to substitute a storage battery for a primary battery it is generally done. And so we never regard the primary cell seriously.

Yet even in electricity we sometimes return to our first love. The first incandescent lamp filament was of metal, and quite impracticable outside the laboratory. That was in 1878 or earlier. Edison hunted the world over for a successful substitute for metal—and found it. Within the last few years we have gone back to the metal filament; everybody knows why it is better.

We used to hear, more frequently than we do now, the phrase "electricity direct from coal." Edison himself was reported to be working on the problem, and he is never known to give up. In early days Grove invented, or discovered, the "gas battery." The principle of this experiment is that two passive electrodes (platinum in the Grove cell) immersed in a neutral electrolyte (as dilute sulphuric acid) and surrounded respectively by oxygen and hydrogen gas, will generate current like a primary cell. The oxygen and hydrogen, although brought into contact only electrically through the medium of the wire connecting the electrodes, combine to form water just as they do under the influence of heat. The water thus formed passes into the electrolyte.

Several inventors have worked and studied along the line suggested by Grove, but so far without any startling result. Nevertheless, we cannot overcome the notion that the Grove gas battery will some day lead to great things. If oxygen and hydrogen produce current, why not coal-gas and air—or gasoline and air—or coal and air? Will we not eventually have a current-generating carburetor that will solve at once all the problems of "electricity direct from coal"? We will. And when we do, its best use will be to drive the motor on electric vehicles.

We would not predict that these things, inevitable though their ultimate development may be, will ever displace the storage battery as an electric vehicle power—because the storage battery itself will be improved too, in like ratio. But we will predict, here and now, that there will be more changes in the current generating part of the electric vehicle in the next fifteen years than are now dreamed of in our philosophy.

Statement of the ownership, management, circulation, etc., of ELECTRIC VEHICLES, published monthly, at Chicago, Ill., required by the Act of August 24, 1912.

Note—This statement is to be made in duplicate, both copies to be delivered by the publisher to the Postmaster, who will send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in hte files of the post office.

NAME OF	POST-OFFICE ADDRESS
Editor, Paul H. Woodruff	7025 Yale Ave., Chicago, Ill.
Managing Editor and Business Manager, Ed J. Mock,	6549 Harvard Ave., Chicago, Ill.
Publisher, Electricity Magazine Corporation,	1252-1256 Monadnock Bldg., Chicago, Ill.

Owners: (If a corporation, give names and addresses of stockholders holding 1 per cent or more of total amount of stock.)

Ed J. Mock	6549 Harvard Ave., Chicago, Ill.
B. C. Sammons	Blue Island, Ill.
John Crocker	Maroa, Ill.

Known bondholders, mortgagees, and other security holders, holding 1 per cent or more of total amount of bonds, mortgages, or other securities: There are no bonds, mortgages or other securities outstanding against ELECTRIC VEHICLES.

ELECTRICITY MAGAZINE CORPORATION,
Per Ed J. Mock, President.

Sworn to and subscribed before me this 17th day of September, 1914.
(Seal) Leona J. Eckstrom.
My commission expires Aug. 17, 1918.

Special Applications of the Electric Truck

Presented at the Fifth Annual Convention of the Electric Vehicle Association

BY F. NELSON CARLE

G. V. Electric Trucks with Electric Coal Dump Bodies Hauling Cracked Ice to Fishing Schooners and Fish Back to Cold Storage Houses.

IN common with most mechanical inventions the electric commercial vehicle has followed certain rather definite lines of development and it is interesting to attempt to trace the various steps involved. The electric truck reached a point where it could be standardized as to basic design in 1906, and while refinements have kept pace with the improvement in motors and batteries, so near right were the proportions of the 1906 design that, generally speaking, no radical departures from it have found permanent favor from an operating standpoint. The importance of this initial standardization has never been fully appreciated. It marked the corner stone of future growth and expansion.

Had some master mind in 1906, or better yet in 1900, been able to see as far ahead as we can see now, what a priceless impetus he might have given the electric truck industry! As it was, even with an approved fundamental design arrived at, the industry made the mistake of reaching out for what we call special business as contrasted with staple business. Instead of producing in quantities, chasses which the dry goods merchant, the grocer, the express company, the brewer, etc., could use and would use in large numbers, some manufacturers allowed themselves to be diverted from the remunerative quantity business and went after false gods in the shape of some of the special applications to which I will later refer.

Generally speaking, the twelve principal fields for the commercial electric are as follows: dry goods; grocery; express and transfer; brewing and bottling; packing and provision; general manufacturing; textile; public utility; professional haulage; internal trucking (industrial); coal and ice; municipal.

These are not necessarily placed in the order of their importance to the industry and many sub-divisions might be added such as bakers, laundries and others in the specialized retail field—jewelers, shoe houses, florists, etc., but the list indicates the principal present and future demand fields for the light and heavy duty electric of standard design.

FOUR CYCLES OF DEVELOPMENT.

The electric truck of 1900 was in a cross between the horse-drawn vehicle it represented in capacity and the 1897 type of passenger electric. That is, it combined certain features of each vehicle. If I were to sum up the progress of the commercial electric during the last 15 years, I would say that from 1900 to 1905 inclusive the pioneer manufacturers tried to see how near they could come to reproducing about all known types of road vehicles while building a very small quantity of the staple types; that in 1906 they settled down to one design and for a period of five years attempted to perfect the vehicles built on that design; and that starting with 1911 they began to adapt by this time proven basic design to the larger needs of a business public alive to the advantages of motor transportation.

One might divide the decade and a half into three cycles, representing experimentation, standardization and specialization. We must not forget that the cycle of experimentation really antedated 1900, or that the present specialization is made possible only by an assured and increasing demand for the staple vehicles in the twelve fields mentioned.

The fourth cycle is obviously quantity production. This really should come before specialization, but there are many things we cannot control in the motor truck business. I hope some savant will, in discussing this paper, tell us how we can sell our standard product after

it is produced in quantities, in view of the 1,001 engineering preferences of those who make out the requisition.

SPECIALIZATION BUT A FORM OF EXPANSION.

The wheel was one of man's greatest contributions to world progress. In America the road wagon followed the cart and then came the carriage and the automobile. The motor truck, as the horseless successor of the early goods wagon, has passed from an idea to an accepted necessity so quickly that it is difficult to keep pace with its development.

Manufacturers have made a mistake in not concentrating upon standard vehicles for the principle trades and leaving the special to follow quantity production on the standard types, but they must in all justice to all consider this: Owing to the varying degrees of assimilation by these principal lines in various parts of the country it has not been practical to depend wholly upon them for all our business. They are up against "zones of education" so far as the electric truck is concerned and a city 1,000 miles away may be ready for electric municipal apparatus before a nearby city has reached the point of absorbing electrics for department store delivery. Then again, gasoline competition has been a factor in making manufacturers follow the lines of least resistance in selling. (I speak now of the industry as a whole and not of the experience of any one manufacturer.)

And after all is said and done specialization is but a form of expansion. They must come to it some day and while it would be better for the industry as a whole if they could precede it by quantity production on the standard types, the rapid increase of special apparatus and of special applications is the measure of our progress in the industry as a whole.

GRADUAL ENTRANCE INTO NEW FIELDS.

Lansden, Studebaker, Columbia, and G. V. electrics were adapted to special operating needs over ten years ago but real development has been in the last six years, perhaps more properly in the last three. Electric coal trucks with hand operated dumping bodies appeared first I understand in 1902, and I find records of relatively practical winch equipped trucks used for handling safes and similar heavy material in 1903. The New York Edison Company has several thirteen-year-old winch equipped Columbia trucks, but I think the winches were added later. Ambulances and buses were among the first special vehicles to follow the electric cab of rather sad history. Thanks to the progressiveness of central stations a large variety of electrics fitted for special work were evolved as early as 1907.

Beginning with 1911, however, developments followed each other very rapidly. The industrial truck, the battery truck crane, the street sprinkler, the electric tractor, several types of fire apparatus and the trackless trolley car, were among the apparatus developed, to be shortly followed by the electric "mule" (lumber tractor) the cotton tractor, street cleaning tractor, etc., etc.

The changes in design and new methods of construction as these relate to the battery or driving mechanism are always interesting, but these features belong more properly in an engineering paper. I have touched upon some of the specialties which have been developed. What I really want to emphasize is the successful adaptation of various types of electrics to new lines of work without altering in essentials the basic design as standardized in several cases seven years ago. A special electric truck can be designed to meet almost any operating condition and were we to make it perhaps of the underslung type (frame and axels very low) with batteries slung pack saddle fashion or otherwise distributed about the frame or body we would have something which would promote a lot of discussion and publicity, but it is of much greater moment to the industry if we can use a standard chassis and by wise engineering produce in body or mechanical equipment something which will do the work right and at a saving over former methods.

CO-OPERATING BETWEEN BUYER AND SELLER.

The question of buying standard equipment is making its advantages felt in many lines of business. Our company at one time built a different type of brewery truck for about every brewer. A little mutual co-operative work has developed a standard keg truck, a standard bottle beer truck and an elastic platform type for beer barrels. The body may vary a little in Pennsylvania and the West but the essentials are the same. Recently the Van Owners Association of New York decided on a van body of 90 cubic feet, thus doing away with the lengthened chassis made necessary for those who thought they needed a box car on rubber tires even though they hauled more goods for the same money that the owner of the standard van received. There is hardly a problem of body design of dumping mechanism or of speed which cannot be settled by a little spirit of give and take and in most cases the buyer will have a chasis with interchangeable parts and a known quantity of operating efficiency.

ELASTICITY CLEARLY DEMONSTRATED.

Down in Savannah cotton is moved by electric stevedores across the great piers into the holds of the steamers which bring it north. At the Bush Docks in Brooklyn the same cotton is placed in cars by battery truck cranes, the cars first being "spotted" by the electric. It is taken out of the cars at the mill by the industrial trucks and moved to storage and then to the spinning room by them. Later the bobbins, dye tubs, and beams are moved from mill to mill by the small electrics while in the mill yard the 2 and 3½-ton road trucks are delivering supplies or loading finished goods for the freight house. No other method is so effective—so clean, dependable, while free from fire risk. In other cases electric wagons are taken up in giant elevators to be loaded on the eleventh floor surrounded by excelsior and other inflammable material. You can't do this with a horse and wagon or with a gasoline vehicle.

The problem of extremes in temperature is something which has been overcome to a gratifying extent. In the Philippines the effects of intense heat on motor and battery have been successfully overcome, and this is true also of electrics in Japan, the West Indies, Brazil, etc. We have found a way to outwit Jack Frost in Canada and parts of the Middle West, and electrics are being successfully operated in below zero temperatures which absolutely tie up gasoline trucks. By careful studies of the effect of grades upon motor and battery we have been able to largely conquer Seattle, Kansas City, Pittsburgh and similar cities. It is only recently that the electric truck has had unqualified success in some hilly cities, but given a full hand in equipping the truck we no longer fear grades involving normal mileages. The same is true of routes involving sand. We may accept the order if the costs of existing methods of hauling are around a certain maximum, but we know how to put the electric through sand, if this is necessary.

All this information costs money, but it broadens the scope of the electric truck and increases the confidence of the business world in it.

Other things being equal from a mileage standpoint, there is no power operated dumping body so satisfactory as one electrically controlled. The advantages of electric vehicle fire apparatus are attracting a lot of attention and when cities enjoy freedom of judgment in the purchasing department and retire some of their enthusiasts we shall see fire departments really motorized. Electric municipal apparatus of all types is rapidly increasing in use and very shortly I hope to see some progressive city with ambulances, patrol wagons, construction and supply wagons, street flushers, sanitary carts, snow plows, and similar equipment electrically propelled and so really up-to-date.

Every city draft horse is an isolated plant. The hand truck pushed by the irresponsible alien is another. So is the mule on the lumber tramway; soon to, the industrial locomotive about our great plants will come under the same heading. It should be a source of great satisfaction to us all to consider that while for years yet its chief mission will be to deliver merchandise about the busiest streets of our cities, the electric truck can and does rise to emergencies, allowing itself to be moulded to the ever increasing special needs of industry and commerce.

Electric Taxicabs for New York

The operation of both passenger and commercial electric vehicles has advanced so rapidly in favor both here and abroad, that the movement now under way to operate electric taxicabs in New York has met favorable comment and instant approval from city and public alike.

Commercial Truck Company's Electric Taxicab.

Electrics have now conclusively proved their commercial success in city service, where even the older, chain driven types are being operated at a cost 25 per cent to 50 per cent lower than is possible with gasoline vehicles doing the same work. Cars manufactured twelve years ago are still in service today and it is reasonable to expect even greater life for the improved models now on the market. Its long life is due to its even acceleration, to the fact that when the car stops the power is shut off and all machinery stops running. When the battery is renewed it is equivalent to renewing the entire motor and transmission on the gasoline vehicle. As the only mechanical connection between controller, battery and motors is flexible copper wire, new parts can be installed anywhere without affecting the efficiency of the other parts. The driver requires no mechanical knowledge, his job being that of a motorman rather than a chauffeur.

With all these points in its favor, the only objections advanced against its use in taxicab service are its speed and mileage capacity.

The six hundred electric cabs in Berlin have a speed of about twenty-five miles per hour. Motors and gearing can be adjusted for any desirable speed,—electric ambulances, fire apparatus, etc., being rated as high as thirty miles per hour,—so that the question of speed need cause no anxiety.

As regards mileage capacity, a careful study of the records of a number of large taxicab companies now operating in New York shows that over 90 per cent of their work could be handled with a wide margin of safety by electric cabs. Of the remaining 10 per cent less than 25 per cent shows any profit, due to the long return trip without fare. So that the loss of less than 10 per cent of the gross profits possible with gasoline vehicles is really a benefit. In a test recently made by the Commercial Truck Company with one of its new taxicabs, by means of short "boosts" of 18 minutes each, the cab ran 120 miles in 12 trips at an average speed of 15 miles per hour. The total running time was eight hours.

Companies are now being formed to operate electric cabs in New York and their success seems assured.

Plan New Mileage Records

For the purpose of demonstrating the possibilities of the modern electric vehicle, both of the pleasure car and commercial truck types, the New York Electric Vehicle Association has perfected plans for the running of a series of mileage tests during the electrical exposition and motor show in New York, October 7-17. These tests will be run on the board track, which is laid out each year on the third gallery of the Grand Central Palace, for the purpose of showing electric vehicles in action during the show.

One of the tests will be for the greatest mileage on a single charge of the battery. It is open to all types but will probably be contested by runabouts, with one or two possible entries of light delivery vehicles. The present record is said to be 244.7 miles. made on the streets of Cleveland, Ohio, in 1911. The road record is 176 miles, made recently in a run from Boston to New York.

A second test provides for a continuous day and night run throughout the ten days of the show. This is to be accomplished by having two batteries to be used alternately, or by giving one battery the required number of short boosts. This test is for commercial vehicles, as the results achieved will be most profitable for this type. As yet there is no record for a test of this nature and the one established during the show is certain to attract wide attention.

In addition, the New York Electric Vehicle Association is offering two handsome cups for road runs to be held during the show, one for pleasure cars and one for motor trucks. The basis on which these awards are to be made has not yet been determined by the directors.

Garage floors should be graded so as to drain to a central point, or points, depending upon their area. Drains of sufficient number and size should be provided to quickly carry off all water and oils.

Parcel Post Delivery Committee

Presented to the Electric Vehicle Association

FOR some time past it has been apparent that the electric vehicle for parcels post and general mail delivery service has not been receiving at the hands of the postal department the consideration which the members of this Association feel it should be accorded.

There is a considerable amount of detail information at hand which indicates this condition to be so, while, on the other hand, in some local places the electric vehicle has been performing satisfactory service in postal delivery, and as you of course know, and the members of our Association will recognize, the electric vehicle has been widely adopted over many fields of activity and especially in work analagous to the requirements of the postal service.

In order to bring properly to the attention of the authorities at Washington this subject, a number of meetings have been had by the directors and members of this Association, as a result of which a consulting engineer was retained to visit Washington for the purpose of ascertaining the exact status at that time. From the information thus gathered our Association obtained possession of facts which led the directors to believe that the authorities will very gratefully receive co-operation at the hands of this Association.

It also became apparent at this interview in Washington with the various members of committees having matters relating to parcel post under consideration, as well as the purchasing agent of the post office department, that the National Electric Light Association would receive special consideration at the hands of the authorities. This in view of the immense co-operation which the department would gain throughout the country in all of the principal cities in the successful conduct of its parcel post operations.

Consequently a special meeting was called by our president on Monday, January 5, 1914, bringing together the directors and a number of the members to consider ways and means by which the general project of advancement of the electric vehicle into this field could be undertaken.

The central station interests, the manufacturing companies, the electric vehicle manufacturers as well as the storage battery and other accessory interests were represented and a number of communications were presented from prominent central station officials who could not be present and in each case these communications contained an expression of support of the general proposition as briefly outlined in the call for the meeting.

After a very free and comprehensive discussion in which nearly every attendant took part and in which all the varying phases of the case were given consideration the sense of the meeting was embodied in the following resolutions, adopted at the informal meeting of the directors of the Electric Vehicle Association of America and representatives of the electric vehicle in central station interests, held in New York on January 5, 1914:

"Whereas, the postal authorities have manifested little interest in the electric vehicle, and are at present considering the purchase of power wagons and equipment for handling the parcels post service;

"Be it resolved, that this Association exert its influence to induce the postal authorities to give the electric vehicle the consideration which it merits;

"Further resolved, that the National Electric Light Association, as the recognized parent of all electrical organizations, be urgently requested to co-operate with the Electric Vehicle Association of America in presenting to the postal authorities and members of Congress the advantages and practicability of the employment of the electric vehicle in the parcels post delivery service.

"Now, therefore, in consideration of the foregoing resolutions it is the opinion of this meeting that the allied forces of the National Electric Light Association, and its company members, the Electric Vehicle Association of America, electric vehicle manufacturers and the manufacturers of electric vehicle accessories, and others interested in electrical development, shall co-operate in a comprehensive plan to attain the object set forth in the foregoing resolutions, and

"Be it further resolved, that the National Electric Light Association be invited to join with this association and co-operate in this movement and to that end a committee of three or not more than five be appointed by the National Electric Light Association to act jointly with the committee of this Association in formulating a comprehensive campaign for the fulfillment of the object of this meeting."

Upon January 9, following this meeting, your president appointed the undersigned committee, which immediately took under advisement the suggestions and recommendations previously advanced as well as the actual details involved in the execution of an extensive scheme to concentrate all the available resources upon the execution of the project thus entrusted to it.

A copy of the foregoing resolutions were transmitted to the president of the National Electric Light Association, with the request that a committee of three or more be appointed to co-operate with our committee; and at the same time we submitted as preliminary campaign material and advice the following:

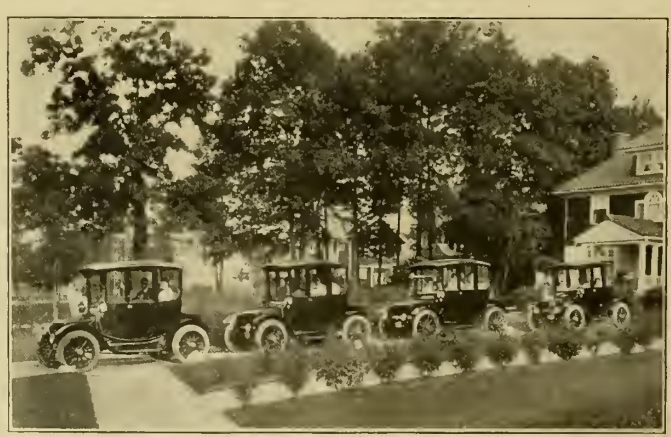
"We desire the active co-operation of all central station executives, they to urge by written appeal and otherwise, congressional senators and representatives to vigorously take up the question, with the purpose of promoting favorable legislation and stimulating activity of the post office department in this direction.

"Point out to the legislators and department authorities the tremendous co-operative influence which can be exerted in all the principal cities throughout the country by the local central station organizations to find local ways and means to stand by and to insure the successful execution of the post office department's purpose if it gives preference to the electric vehicle as a transportation utility.

"Persuade those concerned that it is not desired to place the electric vehicle in service that can be better performed by other means, but insist upon recognition of the fact that for city service, embracing collection, delivery and transfer between stations and depots, the electric can be more economically and expeditiously applied.

"Emphasize our purpose to have available, for co-operation with the department, a strong active committee composed of experienced public utility executives, organization and transportation experts, having no prejudices for particular machines and a fundamental desire for the good of the service.

"Our joint committee will see to it that the department or those interested in the parcels post are acquainted with the superior advantages of the electric machine as an insurance to dependable service and will



Rauch & Lang Electrics in Cleveland.

seek to point out the following facts:

"The electric commercial vehicle has been longer under development than any other type of motor vehicle. It is practically a modification of the electric street car, its design being based upon the same fundamental principles.

"All of its critical parts are the product of the large national electric apparatus manufacturers and are therefore well developed and made of the highest type of workmanship and material.

"Electric vehicle design has been standardized for the past twelve years, no radical changes have been necessary, although minor improvements have been constantly made.

"Other commercial types of motor vehicles have been under development for less than half this period and exist in great variety of design with little semblance of standardization.

"A number of large installations of electric vehicles have been in continuous and successful operation for over ten years. A remarkable number of large installations have been put into operation during the past five years.

"No correspondingly large installations of other types of commercial vehicles exist. This indicates the stability and economy of the electric type.

"The purchasers of these large installations have been most conservative business organizations and those to whom reliability of transportation equipment has been of vital importance.

"Express companies have invested several million dollars in electric vehicle equipment and this type constitutes the majority of their motor vehicle equipment.

"It is conceded by all users of mixed equipments that the electric is considerably cheaper in operation cost than any other type, by reason of its simplicity, fewer parts, ease of control and the standardization of its renewable wearing equipment. No skilled labor is necessary for its operation.

"This Association will immediately address a communication to all the principal vehicle and accessory manufacturers which will outline the campaign and ask for an alphabetical list of all the large installations now in use and for other data necessary as a preliminary step toward compiling the information which our committee will present."

Realizing the necessity for missionary material of a literary character, which would make known to all those co-operating with us and those identified with the post office department whom we desired to interest, it was determined at one of our early meetings that a pamphlet which would deal comprehensively with this particular subject without going into technicalities would be very desirable. Accordingly the committee prepared the booklet known to all of you as "The Electric Vehicle in Parcel Post Service for Economy and Reliability," copies of this are still available to those who desire them.

As soon as this pamphlet was in readiness and before we made any distribution of it we held a meeting to which we invited J. A. Edgerton, purchasing agent, post office department and at which we discussed the advisability of sending this to departmental officials and others as a means of placing our purposes before all concerned and inviting their co-operation. Mr. Edgerton heartily concurred in our plans and materially aided us by a general expression of the disposition of those connected with his department. He assured us that motor vehicles were in favor and realizing the advantages of the electric which we placed before him he believed that as we made further advances with our proposition there would be a general inclination to favorably consider the electric particularly in connection with the co-operation which would thus be given to the government by the central stations throughout the country.

Your committee immediately proceeded to issue six hundred and fifty letters and a copy of the booklet to the members of this Association. Following this about fourteen hundred letters with booklet were sent to the President and his cabinet; the Senate and House of Representatives; state; treasury; war; navy; post office; and interior departments; departments of justice; agriculture; commerce; labor; and civil service, including the Interstate Commerce Commission; United States assistant treasurer; superintendent of mines; collectors of customs at the principal ports of the country; four generals of the general staff of the army; and to the admiral of the navy; also to the Appropriation for Supply Committee; Finance Committee; Post Office and Post Roads Committee of the Senate; the Appropriation Committee, and Post Office and Post Roads Committee of the House of Representatives. In addition to official Washington a letter and a booklet were sent to all the postmasters of the country in cities having a population of ten thousand or over.

The National Electric Light Association Committee on Parcel Post Co-operation as stated below in full, under the able chairmanship of Frank W. Frueauff and assisted by the Associations' executive secretary, T. Commerford Martin, sent two copies of the booklet, with letter, to all the members and manufacturing companies of their association to a number approximating thirteen hundred. This letter with the enclosures was directed to the executives of these companies acquainting them generally with reference to this development and soliciting their support in bringing the matter to the further attention of their United States senators and congressmen; the general idea being to impress Congress with the dependability of the electric vehicle and the willingness of all these public utility companies to lend their support in making successful all electric vehicle installations which the government might cause to be employed in parcel post service.

We extended the campaign to Canada by inviting the Canadian Electrical Association to take up our propaganda and received at once the ready co-operation of the Commercial Committee, whose chairman, Louis W. Pratt, undertook to vigorously spread the gospel. Communications, together with copies of our booklet, were sent at once to all the privately owned lighting companies in Canada explaining the work which was being done in the United States and the obvious advantage of prosecuting a similar agitation in favor of the electric vehicle for postal service throughout the Dominion. They were urged to take up the matter with their respective members of Parliament and their local post masters to whom upon request the booklet and other information has been forwarded.

The vast body of responsive correspondence which has resulted from these collective efforts constitutes remarkable evidence of the impetus which can be given to this or any similar project for advancing the extensive use of the electric vehicle upon its own merits, the recognition of which seems to be broadcast. The assurances of co-operation received from every quarter is a remarkable encouragement and should be a strong incentive to continue the work so well begun. It must be recognized that the road to ultimate accomplishment is a long distance ahead of us and that considerable and very probably tedious effort persistently exerted will be necessary in every singe case where an installation of electric vehicles is under consideration. In opposition to our project there is a strong predisposition undercurrent among all the minor officials in the post offices throughout the country to use gasoline automobiles, which is the natural result of their greater familiarity with this type of machine used as a passenger vehicle. There is also the usual lack of interest amongst these people in the matter of reducing cost or performing the work more expeditiously. It will take a few years of continuous effort on the part of all of us to succeed in what we have undertaken.

We are very glad to be able to acknowledge the assistance we have been receiving and the further co-operation promised by the various sections of our Association in each geographical center of the country. In nearly every case there has been a local committee appointed to carry out the details of our project as they relate to these districts. In some instances there have been special meetings called for the exclusive purpose of taking up the considerations surrounding their local purposes.

Your committee has been able to secure detailed analysis undertaken by the post office department to determine the parcel traffic in each of fifty of the principal cities for specific periods and to develop the cost of transporting these by the various means now available—motor vehicles, horse vehicles, and the regular carriers. We have taken advantage of this information, sending it to the lighting companies in each of these cities as a nucleus in the matter of information. We have asked them to appoint committees of one or two of their young men to make research of the existing conditions and contracts at their post office advising us of their findings from time to time and posting us in advance of the expiration of the local contracts, so that we can bring pressure to bear upon the consideration of electric vehicle employment in the new contracts to be awarded. Thus it will be seen that in addition to all the co-operating influences which we have at work on the general project, we have fifty sets of active energetic young men concentrating upon their local cases in a manner which will not only aid the general campaign but which will bring home to their own organizations the rewards of their efforts.

Some of the data collected so far may be interesting as follows:

The combined figures for the fifty cities (which have a total population of over 25,000,000) show that nearly 11,000,000 parcels were mailed out from these fifty post offices during the interval from October 1 to October 15, 1913, while 3,500,000 parcels were received from local delivery during the same period. The average weight per parcel was 1 lb. 11 oz., and the average postage paid per parcel was ten cents. Almost three-quarters of the total number of parcels handled were delivered by regular carriers without additional expense, while about 350,000 parcels (approximately 10 per cent) were handled by automobiles of one kind or another, at a total cost of $17,653, or about five cents per parcel. In the fifty cities for which figures were obtained one inhabitant in every seven received a package through the parcel post service during the two-week period named.

As indicated above we recognize that this is but the opening chapter of a very comprehensive and a very worthy campaign. It will require the continued interest of every member of this Association and all others whom we have cooperating with us. For the splendid assistance we have received in the past we desire to express our grateful acknowledgment. We trust that our conduct so far of the responsibilities delegated to us may warrant the continuance of that support and confidence which has made our service to this Association a pleasure and a great satisfaction.

T. W. Peters, Commercial Manager, Columbus Power Co., Columbus, Ga.; T. I. Jones, General Sales Agent, Edison Electric Illuminating Co., Brooklyn, N. Y.

Canadian Electric Association.

Commercial Committee.

Louis W. Pratt, Hamilton, *Chairman.*
W. H. McIntyre, Ottawa.
A. P. Doddridge, Quebec.
M. C. Gilman, Toronto.

Respectfully submitted, James H. McGraw, chairman; C. A. Terry; E. S. Marlow; W. P. Kennedy; S. G. Thimpson; O. H. Caldwell.

A Resurrected Waverley

According to W. W. Hudson, of the Waverley Company, the vicissitudes that beset the lives of perfectly good and upright electric automobiles have never been fully described by poet, novelist or historian. The future of a gasoline car may be predicted with more or less certainty when you know the character of the man who drives it. It is either the smash-up or the second-hand junk shop, and it needs no gypsy fortune-teller to say the word. Any reasonably good judge of human nature can read the story in the eye of the gas car owner.

Waverley Electric Float for Indianapolis.

But an electric car has so many lives to its credit in the book of fate that even a cat isn't in it by comparison. Here, for instance, is a picture of a Waverly electric that ought to be dead and buried in a scrap heap by all good rights, yet it may be seen any day in the week on the streets of Indianapolis patiently bearing the burden of a huge loaf of bread and carrying a message to Garcia from one of the sanitary bake-shops of the city.

In its first estate this car was a beautiful Waverley brougham, elegantly finished and furnished, the property of a highly respected widow who resides in a fashionable quarter of the city. It lived on terms of intimate companionship with two Packards, a Chalmers, and a Pope-Hartford in her commodious garage and was well groomed and cared for by a garage man.

There was too much gasoline in the building for safety and one day the whole garage and its contents went up in smoke. The Packards and Chalmers and Pope-Hartford gave up the ghost without a murmur and went forthwith to the scrap-heap; but when the wreckage was removed from the Waverley there it stood, disfigured, but still in the ring. The fire had burned off the coach body and melted the aluminum battery box covers; but the batteries themselves, the frame, and the chassis were practically uninjured. An inquisitive by-stander moved the controller a notch and off it started with as much life and vigor as ever it had.

If the Waverley had been a family horse it would have been pensioned off and sent to pasture for the rest of its natural life; but being only an indestructible thing of steel and lead and copper wire it must go plodding through the streets bearing aloft a banner of the "Staff of Life" as if it hadn't earned the right to a peaceful existence.

If the poor dumb thing had even a horn to express its feelings with it would honk in protest, for there isn't anything very dignified about being wheels to an advertising stunt, even with a group of pretty girls as a part of the procession.

Electric Buses to Coney Island

According to the *Edison Monthly,* visitors to Coney Island during the season just closed were afforded an opportunity of riding in electric coaches, which, if present plans materialize, will soon take their place among New York's transportation mediums.

The Coney Island service was only temporary, the buses being operated during the summer months between Brooklyn Borough Hall and Surf Avenue, Coney Island, rather than being held in dead storage pending the outcome of an application for a franchise to operate over regular routes in Manhattan.

Those who rode in them, particularly those skeptics still reluctant to admit the capabilities of electric vehicles, doubtless received a revelation. As for the speed, the coaches, rated at eighteen miles an hour, held their own with similar carriers of the gasoline types, the Coney Island trip of practically ten miles being covered in from forty to forty-five minutes. So much for speed. As for endurance, each bus made two round trips and covered five miles between the garage and starting points on a single charge of the battery. With adequate boosting facilities it would have been possible to operate the cars all day long and to have maintained a regular schedule.

An illustration of this special type appears on page 193.

A small, sharp spade with a folding handle is a handy tool to carry on a touring trip.

Evils of Overloading Motor Trucks

In Designing, Over-Capacity Is a Necessity—In Operation Overloading Regularly Is Disastrous

BY H. W. ALDEN

WHY are trucks overloaded? For two reasons: first, ignorance of the consequences; second, deliberate disregard of the consequences. What are these consequences? Briefly, disaster to the truck, dissatisfaction for the user, trouble for the maker.

Trucks are at a disadvantage compared with horses. The majority of teamsters have a soft spot in their hearts for their teams and the majority of owners know the limitations of the horse and respect them both for humanitarian reasons and for financial reasons.

Under a severe prodding with the whip a team of horses will struggle and strain and pull a heavily loaded wagon out of a hole. For a short space of time they will work at what would be great over-capacity for the whole day's haul, and they will do it without either temporary or permanent harm.

No sane team-driver would expect to use his horses' over-capacity as a constant thing. He values it for the emergency and zealously avoids such emergencies as far as possible.

The evolution of a truck carries it through four stages: design, manufacture, sale and use. With the first two we are not concerned at present. All trucks must be designed to carry more than their rated load. This is the design stage.

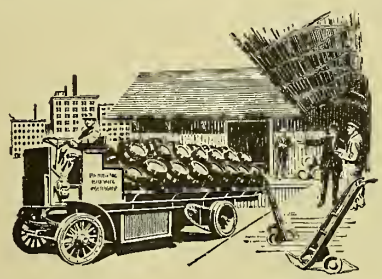
Over-capacity is an absolute necessity. Putting it in engineering parlance, we must have a factor of safety. That is, every part and piece must be somewhat stronger than is necessary to do its work under ideal or even ordinary conditions. Because there will be times when that factor of safety will be necessary. One pound over 1 1-2 tons will not break the back of a 1 1-2 ton truck; neither will ten pounds, a hundred pounds or perhaps three thousand pounds. Its motor can develop more power than it normally needs to move 1 1-2 tons of merchandise. Its axles, bearings, frame and other fundamental parts have reserve strength. That reserve strength is for emergencies—not for every-hour-of-the-day use.

No truck should be overrated. This is the "sales" stage and here is where a great deal of damage has been done to the trade consciously or unconsciously.

While over-capacity is a necessity, overrating is nothing short of a crime. I say crime because it is perpetrated by men who ought to know—by the maker or the seller of the truck, and crime because it is bound to bring a disastrous experience to the user that naturally prejudices him against the motor truck he bought and against motor trucks in general.

Nothing is more harmful to the motor truck industry than overrating. It reflects not only on the manufacturer but on the industry as a whole.

Manufacturers are willing to face facts, and, particularly those facts that are hurting the commercial car industry; to face them boldly and to seek the remedies. That by concerted action we may do many things that individually we can hardly hope to accomplish toward bettering the commercial car industry.



No truck should be regularly overloaded. This is the "use" stage. Here ignorance and indifference are the two causes, both resulting from the scramble for the almighty dollar. The truck is essentially a money earner, or saver (which is the same thing). Hence, the desire to get all there is to be had. However, all trucks are not operated on this basis or there would be no truck business left. But there are enough of them so operated to have seriously restricted the enormous field possible.

While the situation is undoubtedly improving, it is still bad. Those who know about these things must teach those who don't know and must fight those who know and don't care.

Trucks must be honestly rated and used if the industry is to grow as it might.

First, as to the error of overrating. At one of the great truck shows last winter I tabulated the weights and prices of twelve trucks that were rated by their makers at 1 1-2 tons. They varied in weight from 3,750 pounds to 5,700 pounds. Now, if the truck that weighed 5,700 pounds is a 1 1-2 ton truck does anyone here believe that the 3,750 pound truck is also a 1 1-2 ton truck. Without doubt each of the twelve can carry 1 1-2 tons without breaking down. The question is how long can it do this, and the further and more important question, what will be the comparative repair and upkeep expense over a period of years?

I think we will all grant the practical impossibility of officially rating the capacities of all makes of trucks by an independent board of engineers. I doubt if there is a maker who would approve of such a suggestion, but we can perhaps establish a rule that each maker shall publish one and only one capacity rating for each of his chasses and after deducting the weight of the body that goes on the chassis shall mark that rating permanently where the driver can always see it. Such a plan would help to keep over-anxious salesmen from exaggerating the capacity.

This done, the actual performance of trucks having the same rating would settle in the public mind their relative values.

Overloading must be attacked in two ways—teach the public who do not know the fatal results of persistent overloading and fight the man who does but continues his pernicious practice.

Here too we can do by combined action vastly more than we can possibly do by acting singly. Through the trade press, upon whose hearty co-operation I am sure we can rely, we can everlastingly pound out the truth that overloading does not pay. We can preach this gospel over many signatures, from many viewpoints

*Presented at the Detroit Motor Truck Convention.

and in various ways.

We can publish a booklet or pamphlet setting forth in easily understood language the evil effects sure to follow the practice of overloading. We can explain for example, "elastic limit" and picture by microphotographs why it should not be exceeded. We can popularize the term "fatigue" until it seems as real as it actually is and the driver gets the truth that steel as well as horseflesh can suffer from this dread disease.

We can co-operate in the distribution of such a booklet. We can publish instructions on the care of commercial cars; we can impress upon heads of concerns the necessity of knowing that their employees in charge of trucks give them reasonable care and do not overload them.

There exists in the world today only a minute fraction of the commercial cars that can be profitably run if wisely sold and rightly used, and the blame for this condition rests upon our shoulders. We must build trucks right, sell them right and see to it that they are rightly used by the ultimate owner.

Converted by a Taxi

The poor, overworked taxi, which ofttimes is the target of abuse, plays a very important part in our modern existence. Its duties are legion and its treatments severe. It is subjected to destructive wear and tear imposed upon it by traffic regulations and the somewhat unsympathetic operator. Even though the rates usually charged for taxi accommodations are the subject of considerable complaint, the fact remains that the business, as now conducted, is not especially lucrative, and the service must suffer.

A ride in a taxi cannot usually be characterized as thoroughly enjoyable for if it is not the unceasing, incessant tickering of the highly progressive meter, it is the jounces and jars attending stopping and starting at street crossing, or the racing between stops to compensate for the time thus lost.

A few days ago in New York a gentleman and his wife, both of whom have their own cars, had occasion to use a taxi. As they progressed, going over a route that may be described as tortuous, on account of numerous traffic delays, they unconsciously became impressed with the radically different sensation of propelsion effected by their conveyance. The stops at intersections were without jar, and the starts were remarkably quick and smooth—in fact getting under way before other cars had "picked up"; and the uninterrupted going was swift and easy.

Was it the chauffeur? Perhaps. Some chauffeurs are more expert than others in manipulating the rather complicated mechanism of the average taix.

The lady and gentleman arrived home. The man, thinking he had located a good chauffeur for private service, hinted, in paying the bill, at possible employment; also inquiring as to the make of the car. To his amazement the deft chauffeur informed him that it was an electric.

Milwaukee Has New Baker Management

Ralph Penn, manager of the Milwaukee branch of the Ralph Temple Automobile company, 137 Oneida street, has severed his connection with this company and has taken over the agency for Baker electrics and a line of automobile accessories. The Baker electric business will be continued at 137 Oneida street. The past year has been a very good one for Baker electrics in Milwaukee, a large number of cars having been sold during the past six months especially. A carload of new machines, with every up-to-the-minute improvement, will be ready for inspection next week.

Cincinnati Tests Special Electric

The Union Gas and Electric Company, Cincinnati, Ohio, has placed in operation a 1,000-lb. electric truck to be used exclusively in the delivery of electrical appliances.

The manager of the company, P. H. Kemble, recommended the truck after having made a careful study of the costs of various methods of delivery, including street cars, horses and wagons, and motor cycles. It is believed the truck will take care of deliveries in Cincinnati and its suburbs, Covington, Newport, and several more towns on the Kentucky side of the Ohio River very successfully.

The Walker Electric Vehicle Company is the manufacturers of the truck which is designed to run 50 to 60 miles on a single battery charge and maintain a speed of 14 to 15 miles per hour. It is equipped with a 60 to 80-volt, 32-ampere, series-wound motor supplied from a Philadelphia battery of forty-two lead cells. An unusual feature of this truck is that it is equipped with a motor ordinarily used on a 1-ton truck, which will enable it to pull a maximum load up Cincinnati's hills with a relatively low consumption of energy.

Motor Trucks Valuable for War Service

With the aid of the trucks, the Germans are credited with a speed of from thirty to forty miles a day. Of course it must be admitted that this rate was attained over a flat country.

In the Balkans and in other mountainous countries the motor trucks have not proved of so much value as expected in military operations. The Germans chose to make their attack on France through Belgium because of the favorable conditions presented for the use of these modern appliances.

Their motor trucks in many instances have been converted into regular moving forts. Equipped with steel armor, these trucks have been able to resist everything short of artillery.

In some instances it is reported that one or two men in one of these traveling forts equipped with machine guns have cut to pieces scouting parties of the enemy ten times their strength.

The use of these modern devices will tend to shorten the war, although they will increase the loss of life.

In the event of a winter campaign the electric motor trucks may revolutionize military operations, as they can advance rapidly over frozen ground and are free from detrimental effects of freezing.

Buffalo Asks for Convention

The Mayor of Buffalo and the Chamber of Commerce sent a telegram to the E. V. A. convention which lauded the excellent facilities of Buffalo, and called attention to the great conveniences, large number of hotels, shady streets, and last but not least, Niagara Falls.

It is false economy to buy cheap inner tubes. A poor inner tube will quickly put an expensive casing in the scrap pile.

Constitutional Revision Committee Report

Presented to the Fifth Annual Convention

YOUR committee submit the following draft as a proposed form of constitution. In the main, this embodies many features of the present constitution, together with various suggestions made from a study of the constitution of other technical societies and from consultation with officers and members of the association.

ARTICLE I.

NAME AND OBJECTS.

SECTION 1.—This society shall be known as the Electric Vehicle Association of America.

SECTION 2.—The object of this association shall be to promote the dissemination of knowledge in regard to, and the adoption and use of, electric vehicles for business and pleasure purposes.

ARTICLE II.

MEMBERSHIP.

SECTION 1.—The membership of this association shall be designated as active members, auxiliary members, press members, associate members and honorary members.

SECTION 2.—Active members shall be corporations, firms or individuals engaged in the manufacture and sale of electric vehicles, electric vehicle batteries, electric motors or tires, and corporations or firms engaged in the sale of electrical energy.

Each active member shall designate one individual who shall act as official representative. He shall have the right to vote and to hold elective office.

SECTION 3.—Auxiliary members shall be corporations, firms or individuals engaged in the manufacture or sale of electric vehicle accessories.

Auxiliary members shall be entitled to all the privileges of active members of the association, except the right to vote.

Each auxiliary member may designate one individual who may act as official representative.

SECTION 4.—Press members shall be croporations, firms or individuals publishing newspapers or magazines.

Press members shall be entitled to all the privileges of active members of the association, except the right to vote.

SECTION 5.—Associate members shall be employees or representatives of active, auxiliary and press members, and also corporations, firms or individuals owning or engaged in operating electric vehicles or garages, or any persons who are not eligible to active, auxiliary or press membership.

Associate members shall be entitled to all the privileges of active members of the association, except the right to vote.

Corporations or firms who are associate members may designate one individual who may act as their official representative.

SECTION 6.—Honorary members may be chosen from those who are of acknowledged eminence in some branch of art and science relating to the work of the association.

Honorary members shall be entitled to all the privileges of active members of the association, except the right to vote.

ARTICLE III.

APPLICATIONS FOR MEMBERSHIP.

SECTION 1.—Applications for membership, other than honorary, shall be made in writing by the applicants and endorsed by at least two members in good standing and presented to the council. Election to membership shall be by a maiority vote of the council.

SECTION 2.—Honorary members shall be proposed in writing by at least fifteen members and shall be elected only by the unanimous vote of the council.

SECTION 3.—A member may resign from the association by a written communication to the council, and resignations shall be accepted by the council upon payment of dues and other indebtedness.

ARTICLE IV.

DUES.

SECTION 1.—An entrance fee, payable on admission to the Association, may be fixed by the council.

SECTION 2.—The dues of active members engaged in the sale and manufacture of electric vehicles, electric vehicle batteries and electric motors and tires shall be $50.00 per annum, payable in advance.

The dues of active members engaged in the sale of electrical energy in territories of less than 50,000 shall be $5.00 per annum; in territories hetween 50,000 and 200,000, $10.00 per annum; in territories between 200,000 and 500,000, $25.00 per annum; and in territories of 500,000 or over, $50.00 per annum.

SECTION 3.—The dues of auxiliary members shall be $25.00 per annum, payable in advance.

SECTION 4.—The dues of press members shall be $10.00 per annum, payable in advance.

SECTION 5.—The dues of associate members shall be $5.00 per annum, payable in advance.

SECTION 6.—Honorary members shall be exempt from all payment of dues.

SECTION 7.—All dues shall be payable in advance and shall cover the fiscal year commencing October 1. Any member in arrears for sixty days may be suspended from all privileges of membership, but may be reinstated when all outstanding dues have been paid. In the event an applicant for membership shall be elected after May first, the dues for the remainder of the fiscal year shall be one-half the annual fee.

SECTION 8.—The association may publish a monthly magazine to be called "Transactions, Electric Vehicle Association," or such other title as the Association shall select. This publication may be under the direction of the secretary and shall be subject to the approval of the council as to the policy and scope thereof and the expenditures therefor. The annual subscription price of the publication shall be $3.00 and shall be included in the annual dues of members.

ARTICLE V.

OFFICERS.

SECTION 1.—The officers of this association shall be a president, a vice-president, associate vice-president, equal in number to the number of organized sections (of which they are the chairman), twelve directors, and a treasurer.

The above officers shall constitute the council of the association.

SECTION 2.—The president, vice-president, associate vice-presidents and treasurer, shall be elected for one year, or until their successors are elected and qualified and the directors shall be elected for three years. Four directors' terms shall expire each year. Terms of office shall begin the first day of the month following their election.

SECTION 3.—A vacancy in the office of president shall be filled by the vice-president. A vacancy in any of the other offices shall be filled by a vote of the council.

SECTION 4.—No elective officer shall receive directly or indirectly any salary or compensation.

ARTICLE VI.

ELECTION OF OFFICERS.

SECTION 1.—At a business session held the first day of each annual meeting of the association there shall be elected a committee of five (5) members of the association who shall nominate candidates for directors and for officers of the association.

This nominating committee shall, at a subsequent business meeting, held at least twenty-four hours later, bring in the names of those recommended by it for the several offices to be filled. At this meeting other nominations may be made by any member present; and whenever there are more nominees than vacancies to be filled then, in such case, the election shall be decided by ballot. When there is no contest for office, the secretary may be instructed by a viva voce vote to cast the ballot for those recommended by the nominating committee.

ARTICLE VII.

DUTIES OF OFFICERS.

SECTION 1.—The council shall be the governing body of the association, shall manage its affairs and shall pass upon all applications for membership, and shall carry out such special rules and regulations as may be adopted by the association from time to time. Five members of the council shall constitute a quorum.

SECTION 2.—Meetings of the council may be held from time to time upon the call of the president and shall be held at any time upon petition signed by five members of the council.

Section 3.—The president shall have general supervision of the affairs of the association under the direction of the council. He shall preside at all meetings of the council at which he may be present and shall be ex-officio member of all committees. He shall appoint such regular and special committees as may seem necessary, subject to the approval of the council.

Section 4.—The vice-president, or directors in order of seniority, shall preside at meetings of the council or of the association in the absence of the president.

Section 5.—The treasurer shall be the custodian of all funds of the association. He shall furnish a surety bond, and make an annual report and such further reports as may be required by the council.

Section 6.—The secretary shall be selected each year by the president subject to the approval of the council. His compensation shall be fixed by the council. He shall collect all moneys due the association and deposit the same subject to the order of the treasurer. He shall personally certify the accuracy of all bills or vouchers upon which money is to be paid and shall draw all checks, which shall be signed by the treasurer and countersigned by the president. He shall have charge of the office books and accounts of the association and shall furnish monthly to the council a statement of receipts and expenditures. He shall present annually a report to the council for publication, and from time to time furnish such statements as may be required. He shall conduct the correspondence of the association and keep full records and perform such other duties as may be assigned to him by the president or council.

Section 7.—All committees appointed by the president shall report from time to time to the council and shall make no expenditures of money without due authorization by the council.

ARTICLE VIII.

MEETINGS.

Section 1.—An annual meeting of the association shall be held at a place and time designated by the council. At this meeting a report of the proceedings of the association for the past fiscal year shall be presented and an election of officers for the ensuing year shall be held. Such further reports, papers and proceedings may be presented as have been arranged by the president, subject to the approval of the council.

Section 2.—Other meetings of the association may be held at such time and place as the council shall direct, but notice of such meetings shall be sent by mail to all members at least ten days in advance of meeting and such notice shall contain a statement of the purpose of the meeting.

ARTICLE IX.

SECTIONS.

Section 1.—Sections of this association may be organized in any state or locality where a membership of fifteen shall petition the council for right to organize such section. Such section shall subscribe to the constitution of this association, but may also make such special rules and regulations for its government as the members may elect, subject, however, to the approval of the council.

Section 2.—No section shall incur any expense chargeable to the association without first petitioning the council and receiving their approval therefor.

Section 3.—Each section shall forward to the secretary copies of papers and discussions presented at their meetings, which shall be available for use of the association, by the council, or by other sections.

ARTICLE X.

QUORUM.

Section 1.—A quorum at any regular meeting of the association shall consist of fifteen active members in good standing.

ARTICLE XI.

AMENDMENTS AND BY-LAWS.

Section 1.—By-laws or amendments to this constitution may be offered in writing at any meeting, and shall be referred to a committee to be appointed by the president. A two-thirds vote of all active members present shall be necessary for their adoption at a subsequent meeting.

Section 2.—A permanent office shall be maintained in the city of New York, and shall be located, furnished and governed in such manner as the council may from time to time determine.

Section 3.—Roberts' Rules of Order shall be the parliamentary rule of the association in all cases not definitely provided for in this constitution or the association's rules.

New York Electrical Exposition

New York's annual Electrical Exposition and Motor Show was held at Grand Central Palace from October 7-17. In attendance and in number of exhibits, the exhibition surpassed those of previous years. The exhibits were well arranged, and there was a general feeling of satisfaction upon the part of both exhibitors and guests.

The Anderson Electric Car Company exhibited three models of the Detroit electric, including the cabriolet, the forward-drive five-passenger car and the five-passenger duplex-drive car.

S. R. Bailey & Company exhibited its popular touring roadster equipped with Edison battery. This machine has been adopted as an emergency wagon by many central stations.

The exhibit of the Electric Vehicle Association of America was particularly interesting, showing data and curves of operating conditions with comparative data relating to tests concerning horse and electric vehicle operation, as well as comparisons with gasoline-car service.

The exhibit of the 1,000-pound chassis with worm drive and panel body of the General Vehicle Company attracted a lot of attention. There was also a two-ton delivery vehicle and a demonstration of a two-ton chassis on the auto track.

The New York Electric Vehicle Association directed the demonstrations on the auto track and in the electric garage, many cars being shown in actual operation, including the Detroit electric, Bailey roadster, Ward delivery wagons and General Vehicle trucks. The modern garage built by the Andrew Greis Company, exhibited the latest developments in machinery for the care of electrics.

The Ward Motor Vehicle Company exhibited their small electric delivery wagon, the "Ward Special," designed to meet the needs of local tradesmen.

STORAGE BATTERIES EXHIBITS INCLUDED.

The Edison Storage Battery Company exhibiting various types of the Edison alkaline cell. These ranged from the small cells used in miner's and firemen's safety lamps, to 450-ampere-hour batteries for the equipment of brewery trucks, railway tractors, interurban railway cars and heavy duty of all kinds.

The Electric Storage Battery Company exhibited its central-station type and vehicle-type batteries, including the "Chloride Accumulator" and "Exide."

The Gould Storage Battery Company displayed batteries for operation of electric trucks and pleasure cars.

The Philadelphia Storage Battery Company exhibited various types of storage batteries, including equipment for electric trucks and pleasure cars.

Denver Represented in Prize-Story Contest

The Society for Electrical Development, Inc., recently instigated a prize-story competition and announces among the winners Miss Dorothy Allison of the Denver Gas & Electric Light Company. The title of the paper was "The Electric Vehicle—Yesterday, Today, Tomorrow, and Why."

Miss Allison is the assistant secretary of the Denver section of the Electric Vehicle Association of America, a firm believer in electric vehicle service, and an ardent "booster" of "Do it Electrically."

Traffic Committee Report

Presented to the Fifth Annual Convention

THE National Traffic Committee of the Electric Vehicle Association of America was first suggested by President Smith in November, 1913, at which time the Committee on Contests and Endurance Runs was discontinued. E. W. Curtis, Jr., was invited to become chairman, and the following members were appointed to the new committee: Dr. E. E. Pratt, Merchants' Association of New York City; H. F. Thomson, Massachusetts Institute of Technology, Boston; George H. Jones, Commonwealth Edison Company, Chicago; John Meyer, Philadelphia Electric Company, Philadelphia; William Gordon, Century Electric Car Company, Detroit; Harvey Robinson, New York Edison Company; George H. Duck, Sewell Cushion Wheel Company, New York City.

At the first meeting of this committee, a general plan of the work to be undertaken as well as the results desired was laid out, and in order to make the work as far-reaching as possible, each member in his own city was constituted a local committee chairman, and each of these members was invited to organize a sub-committee of such size as might be necessary to carry on a work similar in purpose and character to the work of the national committee. The desirability of having these local sub-committees represented at all of the meetings of the national committee was also impressed upon each of the members.

A list of the various sub-committees and their chairmen follow:

Merchants—Dr. E. E. Pratt.
Research—H. F. Thomson.
Teamsters—George H. Jones.
Street Traffic—John Meyer.
Docks—William Gordon.
Parking Spaces—Harvey Robinson.
Ferries—George H. Duck.
Pavements—E. W. Curtis, Jr.

The local committee in New York City was organized at once and constituted as follows:

E. W. Curtis, Jr., Chairman, Pavements, Vehicle Weights, etc., and Allied Associations.
Dr. E. E. Pratt, Shipping, Merchants, Teamsters.
Harvey Robinson, Street Traffic Regulations, Parking Spaces.
George H. Duck, Docks and Ferries, Rates and Facilities.

The committee felt that the problems confronting the pleasure vehicle were comparatively few and were covered by the general interest in street traffic conditions and the providing of proper parking spaces and equitable adjustment of ferry tolls. The commercial vehicle, however, required a vast amount of attention; looking to a better adjustment of facilities at freight terminals, the hearty co-operation on the part of merchants and shippers, the interesting of city authorities and local organizations in the best type of street pavement and the proper repair of broken pavements.

The committee planned also to encourage co-operation on the part of drivers, teamsters, team owners and their various associations. They desired to obtain the co-operation of architects and engineers in the design and construction of new buildings and the remodeling of old ones, with the idea of providing better loading and unloading facilities. The committee members felt that every effort should be made to reduce congestion at all points. It was thought that this work could be carried on in conjunction with civic and business associations that were seeking the same result. It was felt that special attention should be paid to the weights of vehicles, proper restrictions, taxes, etc., and that this committee might accomplish much that would be of material assistance to the Legislative Committee during the year.

Soon after the formation of the National Traffic Committee it developed that a movement was on foot for the formation of a local traffic commission for the city of New York, whose purpose should be to study in detail traffic conditions and suggest methods for their betterment. In a meeting of our Traffic Committee held December 30, 1913, its chairman was authorized to get in touch with secretaries of other associations interested in New York traffic conditions, and it was resolved that a letter from each association should be addressed to the mayor indicating interest and desire to act in an advisory capacity in the appointment of a traffic commissioner and his staff. Members of the committee were asked to formulate their ideas on the subject, and in the meantime, chairman was authorized to interview the secretary of the Merchants' Association and decide on some form of procedure.

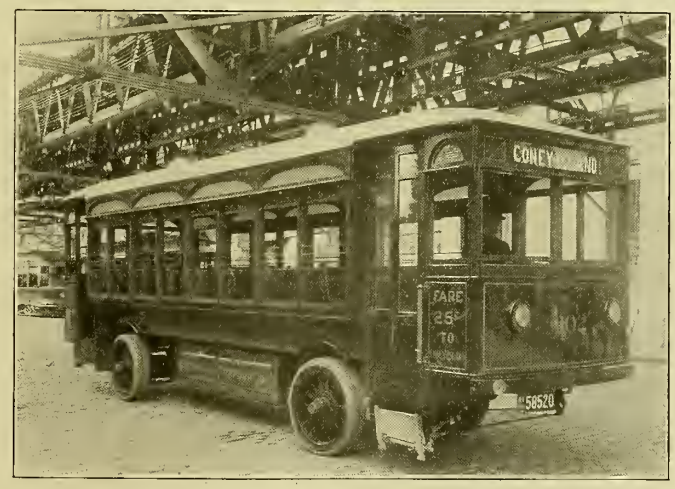
Mr. Curtis undertook to interest the Chamber of Commerce of Queens borough, Mr. Duck the Motor Truck Club, Dr. Pratt the Merchants' Association and Mr. Robinson the Fifth Avenue Association.

The president of the Fifth Avenue Association evidenced a great deal of interest in this project and suggested it might be possible to prevail on the president of the Board of Aldermen or the borough president to appoint such a commission, thus giving it an official standing.

The first meeting looking toward the formation of such a traffic commission was called for January 27, 1914, and the following gentlemen responded:

Robert Grier Cooke, president, Fifth Avenue Association; E. P. Goodrich, consulting engineer to the president of Borough of Manhattan; Joseph K. Orr, Jr., president, Team Owners' Association; George H. Pride, chairman, Traffic Committee; A. B. Cumner, Society Automobile Engineers; Harvey Robinson, New York Edison Company; Prof. J. H. Woodman, New York University; George H. Keegan, Interborough Rapid Transit; Richard W. Meade, president, Fifth Avenue Coach Company; S. W. Taylor, chairman, Committee Uniform Automobile Legislation; J. B. Bernstein, traffic engineer; Elmer Thompson, secretary Automobile Club of America; N. W. Niles, attorney; L. Barton Case, attorney; David Beecroft, *Class Journal;* B. M. Bedell, alderman, chairman Committee on Thoroughfares; James A. Blair, Jr., banker; Prof. A. H. Blanchard, Columbia University; Prof. Collins P. Bliss, New York University; George C. Claussen, Sicilian Asphalt Company; Lloyd Collis, consulting engineer; D. C. Fenner, General Vehicle Company; William P. Eno, traffic engineer; S. C. Gregory, consulting engineer; Geo. P. Hemstreet, Hastings Pavement Company; Frank W. Smith United Electric Light & Power Company; Charles Stewart, Automobile Dealers' Association; Frederick Whitridge, Third Avenue Railway Company; Arthur Williams, New York Edison Company; J. Adamson, Booth Brothers; Clifford Richardson, Barber Asphalt Company; George H. Duck, Electric Vehicle Association; W. R. Addicks, vice-president Consolidated Gas Company; H. A. Bullock, Brooklyn Rapid Transit; Alexander Reed, U. S. Wood Preserving Company.

Mr. Cooke was appointed chairman of the committee and Mr. Thompson secretary. It was decided to call the committee the Citizens



Electric Buses Displace Street Cars in New York.

Street Traffic Committee of Greater New York. A subcommittee was appointed to wait on his honor, the mayor, and the police commissioner, and present copies of a resolution recommending that a deputy police commissioner be appointed whose sole duty should be to direct all matters pertaining to street traffic in Greater New York.

A second meeting of this committee was held February 3, 1914. At this meeting the object of this committee was clearly defined as follows:

"To study traffic problems in the city of New York and do whatever is necessary to improve existing conditions, and in connection therewith to bring about a safe, orderly, economical, equitable and efficient use of the streets, roads and sidewalks within the city, with due regard to the safety of pedestrians."

It was decided to limit the committee to 25 original members with a chairman, secretary and a treasurer; ten members to make a quorum. It was decided to hold regular meetings on alternate Mondays, special meetings at the call of five members.

At a meeting of the committee on March 2, 1914, the following report of the Committee on Plan and Scope was adopted:

1. Additional police supervision by increase of traffic squad.
2. Additional regulation of traffic by state law and ordinance to accomplish:
   - (*a*) More systematic and orderly use of the streets.
   - (*b*) The supervision of traffic so that the various classes of traffic shall be restricted to appropriate hours.
   - (*c*) The most efficient regulation of trucking by classification of service, regulation of hours for deliveries, and regulation of the direction of traffic.
   - (*d*) The most efficient regulation of traffic during exceptional periods as when cab service is delayed and impeded in waiting for church, theatre and opera house audiences.
3. The better regulation of vehicular and street car traffic with a view to eliminating or reducing its interference with other traffic. A consideration of the Railroad Law, with the point in view of improving the paving within the railroad area.
4. The supervision of the streets with a view to seeing:
   - (*a*) That the surface thereof is interfered with as little as possible.
   - (*b*) That contractors, both paving and others, be requested to do their work in accordance with the specifications.
   - (*c*) That back filling where streets are cut open is properly done.
   - (*d*) That public officials be encouraged in their effort in seeing that the work of their departments is done competently and in accordance with the contracts.
   - (*e*) The improvement of street paving with a view to largely reducing the enormous wear and tear caused to vehicles by the bad condition of the street pavements.
   - (*f*) The study of specifications for street pavement and an effort to bring the same to a recognized standard of merit.
5. The study of the use of the streets by pedestrians (adults and children) with a view to regulating such use for the preservation of life and limb and the facilitating of street traffic.
6. A study as to the proper size, weight, and loading of vehicles which should be allowed the use of the streets.
7. A consideration of the present Highway Law with a view to eliminating any objectionable features thereof and strengthening the law with a view to accomplishing a more safe and sane use of the streets.
8. A study of the methods of street cleaning and snow removal.
9. A study of the widening of streets with a view of securing additional space for vehicular traffic.
10. A study of the value of having a central bureau to which all accidents should be reported on a standard form, there to be classified and kept ready for access.

At a meeting of the Citizens Street Traffic Committee on March 30, 1914, members listened to an address by Alderman Bedell, chairman of the Committee on Public Thoroughfares, who stated that he appreciated very much the co-operation with the city committee in studying traffic problems, and stated that while at different times efforts had been made to solve the traffic question there had been such an increase in the number of vehicles used in the street that the situation had become very acute and a more comprehensive means of handling the traffic must be devised.

At a meeting of the Board of Directors of the Electric Vehicle Association on April 24, 1914, it was voted to appropriate the sum of $100 for the use of the Citizens' Street Traffic Committee. Other associations have appropriated a like amount for the same purpose.

On April 21, 1914, a very successful dinner was tendered by the Citizens' Street Traffic Committee to William P. Eno, known as the "Father of Traffic." Over 100 gentlemen were present including present and former police commissioners, officers of traffic squad and many of the city departments.

At a meeting of the Citizens Street Traffic Committee held on May 18, 1914, George H. Duck was appointed executive secretary, and a comprehensive working program was drawn up and work assigned to various committees. The objects which these different committees are seeking to obtain are given briefly as follows:

Additional regulation of traffic by state law and ordinance to accomplish:

- (*a*) More systematic and orderly use of the streets.
- (*b*) The supervision of traffic so that the various classes of traffic shall be restricted to appropriate hours.
- (*c*) The most efficient regulation of trucking by classification of service, regulation of hours for deliveries, and regulation of the direction of traffic.
- (*d*) The more efficient regulation of traffic during exceptional periods—as when cab service is delayed and impeded in waiting for church, theatre, and opera house audiences.

The supervision of the streets with a view to seeing:

- (*a*) That surface thereof is interfered with as little as possible.
- (*b*) That contractors, both paving and others, be requested to do their work in accordance with the specifications.
- (*c*) That back filling where streets are cut open is properly done.
- (*d*) That public officials be encouraged in their efforts in seeing that the work of their departments is done competently and in accordance with the contracts.

The proper size, weight, and loading of vehicles which should be allowed the use of the streets.

Methods of street cleaning and snow removal.

The widening of streets with a view of securing additional space for vehicular traffic.

The value of having a central bureau to which all accidents should be reported on a standard form, there to be classified and kept ready for access.

Specifications for street pavement and an effort to bring the same to a recognized standard of merit.

The improvement of street paving with a view to largely reducing the enormous wear and tear caused to vehicles by the bad condition of the street pavements.

Additional police supervision by increase of traffic squad.

During the month of May, 1914, the Safety First Society of Greater New York through its Street Traffic Committee and its Automobile Technical Sub-Committee began an active investigation of accidents occurring upon the public streets, with a view to intelligently studying the facts and circumstances surrounding each case and applying remedies to prevent similar accidents in the future. In view of the fact that so many organizations had committees working on traffic matters it was decided that it would be desirable to try and unite their activities in one general campaign as applies particularly to the city of New York, and with this end in view the various members of our New York Sub-Committee on Traffic, who are also members of similar committees in other associations, have attempted to act in behalf of all when the opportunity was presented.

In this connection, George H. Duck, the executive secretary of the Citizens' Street Traffic Committee and the direct representative of the Electric Vehicle Association upon this committee, is able to report considerable progress on the subject of docks and ferries as applies to New York City. Due largely to concerted action of various committees there now remain but eleven steamship lines which prohibit the motor truck, and, in nearly every instance, exception is taken in the case of the electric driven vehicle.

Dock Commissioner R. A. C. Smith has conducted a public hearing on the question of ferry rates. The brief for the various traffic associations was handled by a representative of the Merchants' Association. Nearly all of the associations filed a statement of their claims. A very comprehensive tabulation of the rates and facilities of the various ferry lines was presented, which showed a surprising lack of uniformity, and brought up many questions to be answered by the trunk line associations. The hearing was adjourned in order to give the latter an opportunity to reply.

We have every reason to believe that a standard method for determining proper rates will soon be established on all North

River ferries and that the present rates will be considerably reduced so that the motor vehicle rates may conform more nearly to the present horse drawn vehicle rates.

At a recent meeting of the Motor Truck Club of America, Dock Commissioner Smith attended by invitation, and urged the formation of a committee to collaborate with him on the impending improvements on city piers. President George H. Duck of the Motor Truck Club has appointed the following gentlemen to this committee: W. P. Kennedy, chairman, A. J. Slade and N. B. Pope.

Unfortunately, the dock commissioner was unavoidably detained in Europe and has only recently returned so that, as yet, his committee has very little to report.

The Citizens Street Traffic Committee has submitted resolutions to the dock department, asking for better regulations in New York City and West street, and particularly in front of North River piers, and that the various obstructions may be removed and entrances to the piers made more accessible to vehicular traffic.

Harvey Robinson, chairman of Sub-Committee on Street Traffic Regulations and Parking Spaces, reports at length on the activities of the Citizen's Street Traffic Committee along the above lines. Last month this committee held an informal luncheon at the Automobile Club of America to which it invited the heads of the various city departments, also their deputy commissioners, members of the City Planning Committee, inspectors in charge of the traffic squad of the New York City police, members of the Aldermanic Traffic Commission and deputy police commissioners who are acting on the special Traffic Committee of the police commissioner.

William P. Eno, the "Father of Traffic" was also present. After luncheon, he explained by diagrams the many advantages of the "Island of Safety" as installed on the streets and boulevards of London, Paris and New York. The party was then invited to take a ride on the upper deck of several buses of the Fifth Avenue Coach Company, and a tour of inspection covering nearly three hours and about 20 miles of New York City streets was made in the interests of street traffic regulations, the removal of obstructions, and the proper distribution of parking spaces of livery vehicles, sight-seeing buses and taxicabs. Frequent stops were made at various points on a very carefully prearranged schedule. In this way, a great many very important illustrations of the different claims were brought to the attention of the head of the department affected. Explanations and suggestions followed, and in most cases the buses were drawn up side by side for a general discussion of the question before the subject was dismissed and buses proceeded to the next point of interest. This can be recommended as a very efficient method for getting results and the committee feels that its afternoon was very well spent.

The consensus of opinion seemed to be that traffic of New York City requires a more even distribution and that parking spaces for taxicabs may be located at a greater distance from the point of call, thus making available space which can be used to great advantage in handling traffic that is now badly congested.

Members of the Police Commissioner's Traffic Committee are now experimenting with the north and south Traffic on Fifth Avenue by dividing the avenue into blocks, each block covering five cross streets, allowing north and south traffic to move five city blocks north and south on the avenue before it is halted for crosstown traffic. In this connection, various forms of semaphores and signalling devices are being tried in an attempt to have the various traffic officers work in harmony.

The Police Commissioners' Traffic Committee has recently adopted the suggestion of the Citizens Street Traffic Committee and Mr. Eno's plan for rotary traffic at Fifth avenue and 57th street. This plan contemplates five isles of safety, one at the intersection of the center line of these two streets which will be equipped with a crow's nest for the traffic policeman and approved form of signalling device; and the other four isles of safety placed in the center of the streets radiating from the central isle of safety. The four corner sidewalks will be cut back with a radius of 46 feet and all traffic whether north, south, east or west will be compelled to swing in a circle following the same plan now used on a much larger scale at Columbus Circle.

Dr. E. E. Pratt, chairman of the Sub-Committee on Shipping, Merchants and Teamsters, is still abroad. I believe, however, that the chief matter of interest with which this committee has had to deal is the fight for tail-board delivery brought before the Interstate Commerce Commission by the New York Team Owners' Association and others against the railroads having terminals in this city.

The movement of package delivery into and out of New York terminals is enormous; the movement is complex, it is conducted in a limited area and it is slow. The Team Owners' Association charges that the railroad and steamship companies do not perform their full duty as common carriers of freight for hire, or the full service which they exact and receive from shippers and consignees compensation, in that they do not make a proper and complete delivery of merchandise mover interstate at their respective terminals, and by the maintenance of obsolete methods of handling merchandise, there is unnecessary congestion, unreasonable necessary delay in obtaining merchandise, both of which tend to put an unnecessary expense upon the team owner.

These facts were presented in a very able paper by Joseph K. Orr of the New York Team Owners' Association before the Motor Truck Club at its May meeting. His paper was followed by the reading of a letter from an officer of the New England Steamship Company, describing certain changes that have been made for receiving freight at the Fall River Line Piers in New York City. This change excludes from the pier all trucks delivering outbound freight. This freight is received at the bulkhead. A large fleet of electric industrial trucks have been installed. These take the freight from the bulkhead and deliver it directly on board steamer. No teams loaded with freight use the pier, which is left entirely for the use of teamsters looking for inbound freight. Over 900 teams a day are thus eliminated from this pier. Under the old arrangement, the teamster with one or two light shipments had to wait as long to get freight as a man with a full load. It is now a regular occurrence to see such a teamster draw up his wagon within 75 feet of the platform at the bulkhead, carry over his several packages and get away within a very few minutes.

The electric industrial trucks are also used to handle as much of the inbound freight as is economical and matter of time will allow. The improvement in service afforded shippers, the economy in handling and marked improvement in the congestion of teams on West street in the front of the pier has conclusively proved the wisdom of this change.

The Citizens Street Traffic Committee are urgently pushing certain recommendations in regard to pavements but very little progress has as yet been made. The question of vehicle weights seems to indicate the desire of state and city legislators to place a limitation on the gross weight of a vehicle loaded, irrespective of the number or width of wheels which distribute the load on the road surface. In Massachusetts, Maryland and New York the maximum gross weight allowed is 28,000 lbs. In New Jersey the limit is 26,000 and in Pennsylvania, 24,000 lbs.

Regarding the work of the various sub-committees of our own National Traffic Committee which has not already been reported, H. F. Thomson, chairman of the Research Committee, has submitted a chart showing the results of handling L. C. L. freight in Boston, in which time lost on account of traffic stops is only 0.4 per cent. of the total working day. The result of these observations was presented in a paper entitled "Delivery and Handling of Miscellaneous Freight at Boston Freight Terminals" before the New York Railroad Club on September 18.

George H. Jones, chairman of the Sub-Committee on Teamsters, reports that traffic interests in Chicago have been vigorously agitated in the last few months by members of local civic bodies in connection with the solution of the terminal question. This finally crystallized in the adoption of an ordinance providing for the erection of new freight terminals for railroads now entering the Union station on Adams street. These plans contemplate the opening up of a number of streets which have heretofore been occupied by railroads. The final working out of these plans will probably take several years, but they will undoubtedly greatly facilitate the handling of package freight in Chicago.

On September 1 the city of New York put into operation an ordinance which embodies the near-side stop for all surface car lines. Apparently, there was very little confusion and the new scheme quickened the service perceptibly. The public responded more readily than had been expected, as no traffic rule of such wide application has hitherto been introduced, the comparative ease of its enforcement indicates how promptly changes of system in the whole traffic regulation could be accomplished if necessary.

The general traffic of New York City undoubtedly requires redistribution and a much more uniform distribution than adopted at present. The main problem so far has been the fancied difficulties of putting the changes into practice. The comparative ease with which the New York public has adopted the near-side stop for street cars should encourage the traffic committee of the police department to inaugurate many other changes which have already been suggested for a more uniform distribution of New York City traffic.—Respectfully submitted, D. C. Fenner, chairman, George H. Duck, William Gordon, John Meyer, George H. Jones, Dr. E. E. Pratt, Harvey Robinson, H. F. Thomson.

Registration List of the E. V. A. Convention

Members and Guests Who Attended the Philadelphia Meeting October 19, 20 and 21.

REGISTRATIONS of members, guests and friends at the fifth annual convention of the Electric Vehicle Association of America reached a total of 443. A list of the registrants is reproduced here in alphabetical order:

Adam, J. N., Newark, N. J.
Agarn, Wm. D., Philadelphia.
Aiken, Miss Virginia E., Brookline, Mass.
Aloe, S., Philadelphia.
Alpin, B. J., New York City.
Althouse, Mrs. A. J., Hamburg, Pa.
Althouse, A. J., Hamburg, Pa.
Ambler, A. C., Philadelphia.
Anderson, R. M., Philadelphia.
Arlington, D. C., Chicago, Ill.
Aspell, T. A., New York City.

Bachman, Baliert A., Orange, N. J.
Baker, Day, Boston, Mass.
Baker, Charles Whiting, New York City.
Baldwin, Henry S., West Lynn, Mass.
Ball, W. D., New York City.
Barker, John H., New York City.
Bartlett, J. C., Philadelphia.
Bartlett, Mrs. J. C., Philadelphia.
Bartlett, P. H., Philadelphia.
Bechtel, H. N., Philadelphia.
Becker, Joseph F., New York City.
Bee, W. G., Orange, N. J.
Bell, W. B., Newark, N. J.
Bell, Mrs. W. B., Newark, N. J.
Bellis, W. S., Philadelphia.
Benson, W. W., Philadelphia.
Berger, C. F., Philadelphia.
Berry, M. R., Cleveland, O.
Bishop, R. E., Philadelphia.
Blizard, Charles, Philadelphia.
Blodgett, C. C., New York City.
Blood, W. H., Boston, Mass.
Bobb, Ralph H., Philadelphia.
Bowes, Dr. T. J., Philadelphia.
Bracker, H. E., Philadelphia.
Brandt, H. J., Philadelphia.
Brandt, Wm. Van C., Pittsburgh, Pa.
Brennan, J. W., Detroit, Mich.
Brintoy, Willard C., New York City.
Berry, A. F., New York City.
Brouse, R. W., Philadelphia.
Brown, George R., Philadelphia.
Buckwolter, W. M., Philadelphia.
Buell, C., Millville, N. J.
Burke, J. A., New York City.
Burke, T., Philadelphia.
Burch, Frank S., Philadelphia.
Burns, Arthur H., Philadelphia.
Bush, Mrs. E. V., Sewall, N. J.
Buzby, G. H., Philadelphia.

Chalfant, E. P., New York City.
Clark, F. W., Philadelphia.
Clegg, W. H., Philadelphia.
Coe, A. V. R., Philadelphia.
Cole, H. B., Baltimore.
Conant, W. H., Detroit.
Conde, C. A., Camden, N. J.
Corliss, S. T., Camden, N. J.
Cox, W. A., Newark, N. J.
Cummings, A. H., Akron.
Crossman, E., New York City.
Cushing, H. C., Jr., New York City.
Cleaver, N. S., Philadelphia.
Coffin, Robert C., New York City.
Conley, J. B., Lake Mills, Iowa.
Cummings, A. H., Akron, O.
Coe, Miss Ethel M., Riverton, N. J.
Coe, Miss Marion M., Riverton, N. J.
Clark, W. B., Philadelphia.
Class Journal Pub. Co., Philadelphia.

Corey, J. A., Philadelphia.
Campe, H. A., Pittsburgh, Pa.
Coane, J. G., Philadelphia.
Coe, G. A., Philadelphia.
Cameron, A. C., New York City.
Cary, B. P., Philadelphia.
Carle, F. Nelson, Long Island, N. Y.

Day, B. F., Philadelphia.
De Lacy T., Philadelphia.
Dalsimer, Leon S., Philadelphia.
Denniston, E. E., Buffalo.
Dickie, E. N., Philadelphia.
di Martino, Raphael, Philadelphia.
Donkin, William A., Pittsburgh, Pa.
Dietrich, H. V., New York City.
Davison, H. L., Orange, N. J.
Donnelly, A. A., Philadelphia.
Donnelly, W. H., Philadelphia.
Donley, A. L., Philadelphia.
Donley, S. W., Philadelphia.
Dodge, H. P., Toledo, O.
Doering, H. H., Cleveland, O.
Dougherty, J. E., Philadelphia.
Dyre, W. T., Philadelphia.
Dresser, S. R., New York City.
Dixon, A. L., Washington, D. C.
Duck, George H., New York City.
Drummer, C. H. Philadelphia.
Dumont, R. D., New York City.

Eglin, William C. L., Philadelphia.
Eglin, Miss Jane, Philadelphia.
Ehrlich, Howard, Chicago.
Elwell, J. M., Philadelphia.
Elwell, William, Philadelphia.
Eley, R. B., Philadelphia.
Eustis, John, New York City.

Fanciulli, Romolow, New York City.
Fenner, D. C., New York City.
Ferris, S. C. W., Philadelphia.
Fink, F. B., Philadelphia.
Finley, G. G., Philadelphia.
Fisher, R. S., Philadelphia.
Fitch, Morton J., Lynn, Mass.
Fitch, Mrs. M. J., Lynn, Mass.
Fogler, W. A., Philadelphia.
Foote, E. T., New York City.
Flanders, L. H., Philadelphia.
Fogarty, J. J., Philadelphia.
Foljambe, E. S., Philadelphia.
Ford, Bruce, Philadelphia.
Foster, Geo. B., Chicago, Ill.
Frayer, C. B., Chicago, Ill.
Freeman, G. A., Chicago, Ill.
French, C. W., Philadelphia.
Frent, C. W., Philadelphia.
Freeman, W. W., Cincinnati.
Fisher, F. E., New York City.
Foster, Mrs. Geo. B., Chicago, Ill.
Franklin, S. J., Millville, N. J.
Fretz, A. O., Doylestown, Pa.

Gabrylewitz, Theodore, Philadelphia.
Gforer, Albert H., New Brighton, Staten Island.
Garde, J. F., Philadelphia.
Getz, A. M., Lansdowne, Pa.
Gilbert, F. E., Philadelphia.
Gilchrist, John F., Chicago, Ill.
Goldman, Albert, New York City.

Gray, B. D., Philadelphia.
Gwyn, Lewis R., Philadelphia.
Gridley, Sydney, Philadelphia.
Gross, Malcolm L., Philadelphia.
Groud, G. M., Philadelphia.
Grove, Robert B., New York City.
Guest, H. E., Philadelphia.
Goetz, W. W., Philadelphia.
Good, John, Philadelphia.
Gray, A. A., Philadelphia.

Halsey, W. W., New York City.
Hawks, W. M., Philadelphia.
Hancock, E. J., Philadelphia.
Hanlon, L., Philadelphia.
Haase, A. L., Chicago, Ill.
Hadley, A. L., Fort Wayne, Ind.
Haines, Carroll A., Philadelphia.
Haines, Wm. A., Philadelphia.
Hale, J. E., Akron, O.
Hiester, A. O., Cleveland, O.
Harding, J. V., Akron, O.
Hare, E. S., Philadelphia.
Harris, P. C., New York City.
Hincher, W. W., Pittsburgh, Pa.
Huss, Frank, Philadelphia.
Hart, H. B., Jr., Washington, D. C.
Healey, Robert, Philadelphia.
Henderschott, F. C., New York City.
Hillman, H. W., New York City.
Hoffer, C. B., Philadelphia.
Holland, Walter E., Detroit.
Hoover, H. J., Cincinnati.
Hurlick, Miss S. G., Philadelphia.
Hunnewell, J. A., Lowell, Mass.
Humphreys, C. J., Lawrence, Mass.
Hunger, E. A., New York City.

Israel, J. D., Philadelphia.
Israel, Miss Ruth, Philadelphia.
Israel, Mrs. J. D., Philadelphia.
Irwin, C., Philadelphia.

Johnson, W. H., Philadelphia.
Johnson, Mrs. W. H., Philadelphia.
Jones, T. I., Brooklyn, N. Y.
Johnson, W. H., Philadelphia.
Johnson, Joseph G., Philadelphia.
Johnson, Miss G., New York City.

Kaerman, W. E., Akron, O.
Kalas, Frank T., Washington, D. C.
Kammerhoff, M., Orange, N. J.
Kanan, J. R., Philadelphia.
Kelly, George H., Cleveland, O.
Kennedy, William P., New York City.
Kerford, Mrs. W. K., Philadelphia.
Kern, N. R., Philadelphia.
Kimball, Fred. M., Lynn, Mass.
Kimball, Miss W. R., Newton, Mass.
Kinsey, J. R., New York City.
Kelley, John, Orange, N. J.
Kerford, W. K., Philadelphia, Pa.
Kline, James T., Ft. Wayne, Ind.
Koockergy, H. A., Philadelphia.
Koockergy, Mrs. H. A., Philadelphia.
Koockergy, Miss M., Philadelphia.
Kucera, Joseph A., New York City.

Lay, H. T., Pittsburgh, Pa.
Lentz, C. M., Philadelphia.
Lesley, Hugh, Philadelphia.

Lightcap, R. H., Philadelphia.
Lloyd, R. Louis, Philadelphia.
Lockhart, W. J., Philadelphia.
Luxenberg, C. H., Philadelphia.
Lynch, C. F., Philadelphia.
Lyons, J. P., Cleveland, O.

McAllister, A. S., New York City.
McCall, J. A., Philadelphia.
McClure, H. M., Philadelphia.
MacCain, R. M., Philadelphia.
McGowen, E. B., Philadelphia.
McCreery, Philadelphia.
McCall, J. B., Philadelphia.
McDonald, Joseph F., Cambridge, Mass.
McDonald, J. F., Cambridge, Mass.
McDougal, Toronto, Ontario, Canada.
McDowell, W. J., Chicago, Ill.
MacFadden, John J., Philadelphia.
McGahan, Paul T., Philadelphia.
McGehan, T. H., Akron, O.
McGraw, James H., New York City.
McHenry, I. D., Philadelphia.
McHenry, Mrs. I. D., Philadelphia.
MacMillan, F. E., Philadelphia.
Malseed, W. H., Philadelphia.
Mansfield, E. S., Boston, Mass.
Manwaring, W. A., Philadelphia.
Marlow, E. S., Washington, D. C.
Marsh, Charles M., Washington, D. C.
Marsh D. Converse, New York City.
Marshall, A. J., New York City.
Mason, G. Roy, New York City.
Mayers, A. F., Philadelphia.
Maxwell, Joseph T., Philadelphia.
Maxwell, Mrs. Joseph T., Philadelphia.
Meakin, J., Philadelphia.
Merrick, W., Philadelphia.
Merrick, R. K., Philadelphia.
Menefee, S. W., New York City.
Metcalf, W. H., Philadelphia, Pa.
Metcalf, Mrs. W. H., Philadelphia.
Metz, A. G., Philadelphia.
Meyer, John W., Philadelphia.
Middleworth, H. V., New York City.
Milford, I. H., Philadelphia.
Miles, Charles H., Boston, Mass.
Miller, Preston T., Springfield, Mass.
Miller, W. J., Newark, N. J.
Milward, S. C., Philadelphia.
Mohr, Howard K., Philadelphia.
Morrell, Harry H., New Haven, Conn.
Morris, A. V., Philadelphia.
Murray, J. M., Brooklyn, New York.
Moses, Paul E., New York City.
Mallett, J. P., New York City.
Monville, F. X., Philadelphia.
Mullen, E. D., Philadelphia.
Murphy, James, Renova, Pa.
Muselman, C. A., Philadelphia.
Mustard, J., St. Louis, Mo.
Muth, George B., Philadelphia.

Neely, Frederick B., Philadelphia.
Neely, Mrs. F. B., Philadelphia.
Ney, S. L., Philadelphia.
Nice, J. Layton, Philadelphia.
Nicholson, Mrs. S. M., Philadelphia.
Nims, A. A., Ampere, N. J.
Norton, S. V., Akron, O.
Norton, Mrs. S. V., Akron, O.

Orum, S. R. M., Philadelphia.
Owen, C. D., Newark, N. J.

Painter, J. G., Philadelphia.
Phillips, E. T., Philadelphia.
Pearson, L. J., Philadelphia.
Peck, A., Buffalo, N. Y.
Pendleton, R., Buffalo, N. Y.
Pierson, Ward W., Philadelphia.
Pike, F. M., Cleveland, O.
Platt, Nathaniel, New York City.
Powers, E. L., New York City.
Pressman, H. J., Philadelphia.

Parsons, A. E., Hartford, Conn.
Patton, William H., Philadelphia.
Pearson, C. E., Philadelphia.
Pierson, Mrs. W. W., Philadelphia.
Peck, F. G., Buffalo, N. Y.
Phelps, Frank N., Boston, Mass.
Pembleton, F. D., Newark, N. J.
Pratt, H. E., New York City.
Price, Charles W., New York City.
Pullen, Rodney S., Philadelphia.

Radcliff, John, Jr., Yonkers, N. Y.
Rakestraw, A. G., Atlanta, Ga.
Reast, Fred M., Brooklyn, N. Y.
Reed, Carl H., Philadelphia.
Reilly, J., Philadelphia.
Regar, G. B., Milbourne, Pa.
Regar, Mrs. G. B., Milbourne, Pa.
Reynolds, E. L., Philadelphia.
Rice, H. H., Indianapolis, Ind.
Riley, Peter F., Philadelphia.
Rae, Frank B., Jr., New York City.
Robinson, Harvey, New York City.
Robson, H., Philadelphia.
Russell, Robert E., Schenectady, N. Y.
Ritter, William H., Philadelphia.
Robins, Fred K., Philadelphia.
Rosenberg, P. C., Philadelphia.
Ross, E. J., Jr., Orange, N. J.
Ruschmann, F. L., Philadelphia.
Rutherford, F. B., Philadelphia.

Salom, P. G., Philadelphia.
Schoepf, T. H., East Pittsburgh.
Schwank, J. L., Philadelphia.
Scott, E. M., Philadelphia.
Scull, William B., Philadelphia.
Scull, Mrs. W. B., Philadelphia.
Seaman, J. B., Philadelphia.
Seelman, M. S., Brooklyn, N. Y.
Segrest, Miss Anna, Philadelphia.
Sell, Madam, Philadelphia.
Seltzer, Henry F., Philadelphia.
Stillwell, John, New York City.
Sheldrake, J. S., Philadelphia.
Simkins, H. M., Philadelphia.
Simpkins, Mrs. R. H., Collingswood, N. J.
Silbert, P. H., Philadelphia.
Silbert, Mrs. R. H., Philadelphia.
Simon, O. H., Philadelphia.
Simpson, G. O., Akron, O.
Skinner, James M., Philadelphia.
Smith, C. Monroe, Philadelphia.
Smith, Frank W., New York City.
Smith, Harold H., Orange, N. J.
Smith, H. R., Philadelphia.
Smith, H. R., New York City.
Smith, S. D., Philadelphia.
Snedaker, A. C. H., Buffalo, N. Y.
Sneed, W. F., Philadelphia.
Snyder, Geo. A., Philadelphia.
Spaulding, A. B., Newark, N. J.
Sproule, Thomas, Philadelphia.
Steele, Geo. D., Philadelphia.
Stone, Frank J., Boston, Mass.
Summerfield, Ch. W., Philadelphia.
Smolens, M., Philadelphia.
Smith, Edward, Philadelphia.
Smullen, S. W., Philadelphia.
Smullen, Mrs. S. W., Philadelphia.
Sterling, H. W., Philadelphia.
Street, C. A., Chicago, Ill.
Stoll, O. E., Philadelphia.

Thatcher, Paul, Germantown, Pa.
Thayer, Willis M., Hartford, Conn.
Thayer, Mrs. Willis M., Hartford, Conn.
Thompson, S. G., Newark, N. J.
Thompson, Walter L., New York City.
Thomas, Neil A., Lansdowne, Pa.
Thompson, G. L., Philadelphia.
Thompson, H. F., Boston, Mass.
Tobias, David F., New York City.
Tracy, J. H., Philadelphia.
Trout, C. B., Philadelphia.

Ullman, William, Washington, D. C.

VanGieson, C. J., Newark, N. J.
Vogel, J. C., Philadelphia.

Wachter, William, Philadelphia.
Wagoner, P. D., Long Island City, N. Y.
Waters, Harry, Philadelphia.
Walker, George S., Philadelphia.
Walton, Frank S., Philadelphia.
Whitehorne, E. E., New York City.
Whitney, F. E., Philadelphia.
Wells, H. W., Philadelphia.
Wagner, Harrison W., Baltimore, Md.
Walsh, E. J., Philadelphia.
Wanamaker, S. R., Philadelphia.
Ward, Charles A., New York City.
Warren, C. B., New York City.
Wengel, H., Philadelphia.
White, Clifford A., Boston, Mass.
Whitney, E. R., Philadelphia.
Whitten, F. A., Pontiac, Mich.
Wible, H. M., East Pittsburgh, Pa.
Wilson, Dillon B., Philadelphia.
Wilson, Mrs. Dillon B., Philadelphia.
Wright, E. C., New York City.
Wright, E. M., New York City.
Wright, W. E., Philadelphia.
Wakeman, J. M., New York City.
Wallis, J. E., Philadelphia.
Wood, Elmer E., New York City.
Welsh, C. J., New York City.

Young, Mrs. T. W., Camden, N. J.
Young, A. W., Camden, N. J.
Young, R. R., Newark, N. J.

Zoller, F., Philadelphia.

LADIES WHO ATTENDED THE COUNTRY CLUB RUN TUESDAY MORNING.

Miss Virginia E. Acker.
Mrs. J. C. Bartlett.
Mrs. W. Bell.
Mrs. E. F. Bush.
Mrs. W. A. Cox.
Mrs. Geo. F. Cawan.
Miss W. E. Cameron.
Mrs. August W. Donnelly.
Mrs. M. J. Fitch.
Mrs. G. V. Foster.
Mrs. T. Garbeywytz.
Miss S. G. Hurlick.
Mrs. J. S. Harding.
Mrs. Jos. D. Israel.
Miss Ruth Israel.
Mrs. G. Johnson.
Mrs. A. P. King.
Miss W. P. King.
Mrs. Fred M. Kimball.
Miss W. R. Kimball.
Mrs. H. O. Koockegey.
Miss Nora M. Koockegey.
Mrs. Wh. K. Kuford.
Mrs. R. L. Lloyd.
Mrs. T. H. McGiehan.
Mrs. W. H. Metcalf.
Miss A. H. Metcalf.
Mrs. Samuel W. Menefee.
Mrs. J. J. O'Neill.
Mrs. F. B. Neely.
Mrs. S. M. Nicholson.
Mrs. W. W. Pierson.
Mrs. W. B. Scull.
Mme. M. M. Sell.
Mrs. W. M. Thayer.
Miss Bee Tilton.
Mrs. W. T. Young.
Mrs. A. W. Young.
Mrs. Dillon B. Wilson.

PERSONAL AND BUSINESS NOTES.

Titan Storage Battery Company, Newark, N. J., has opened an office in Chicago at 2332 Michigan Avenue, in charge of D. M. Simpson.

Mr. Simpson has had a wide experience in storage battery work and his reputation for fair dealing which has characterized his efforts will, in conjunction with the standard quality of our batteries, win the patronage of careful buyers.

The Ward Motor Vehicle Company will erect a factory on South Fulton avenue, Mount Vernon, N. Y. The company is now located in the Bronx, New York City.

The net earnings of the Stewart-Warner Speedometer Company for the quarter ended June 30 last, exceeded $400,000 on the common stock, and for the six months ended June 30, the net earnings applicable to dividends approximated $600,000. This is equivalent to the full year's seven per cent on the preferred stock, and six per cent for six months on the common.

The Columbus Buggy Company, Columbus, O., recently purchased by Charles A. Finnegan and Eugene D. Hofeller of Buffalo, N. Y., is now operated with a fairly large force of men. The company is manufacturing both electric and gasoline automobiles, as well as all kinds of horse drawn vehicles.

The Indestructible Tyre Company has been incorporated in Wilmington, Del., with a capitalization of $1,000,000 to manufacture tires of all kinds. The corporators are: J. McLaren, F. B. Knowlton and V. Dowling, all of New York City.

George H. Duck, president of the Motor Truck Club of America, who has been prominent in the motor truck industry for several years, has been appointed manager of the Sewell Cushion Wheel Company, New York, N. Y., with offices in the United States Rubber building.

The General Motors Company has purchased for its sinking fund $2,000,000 of the company's six per cent first lien five-year gold notes in anticipation of its obligation to pay $2,000,000 cash October 1 to its trustees for sinking fund purposes. With the cash deposited, a total of $7,099,000 notes have been purchased, leaving outstanding $7,901,000 of notes which mature October 1, 1915.

Henry Farrington, editor of *Power Wagon*, has accepted the position of publicity manager of the truck department of the Thos. B. Jeffrey Co., Kenosha, Wis., and will devote his energy to the advertising of Jeffrey trucks.

The Goodyear Tire & Rubber Co., Akron, O., has just completed its new building at 1601 Michigan Ave., Chicago. The new structure is six stories high. The Goodyear company will use the first floor and basement. C. M. McCreery is manager of the Chicago branch.

The Firestone Tire & Rubber Co., Akron, O., has recently distributed to its pneumatic tire dealers throughout the country a 15 by 28-inch two-color poster showing the various Firestone accessories for repairing and maintaining pneumatic tires. The poster is intended to be hung on the wall or in the window and to serve as a reminder of the accessories manufactured by the Firestone company.

C. L. Allen, formerly motor vehicle sales manager of the Pyrene Mfg. Co., New York City, makers of the Pyrene hand fire extinguishers, has recently been promoted to the position of general sales manager.

Volney S. Beardsley, president and manager, and John T. Shannon, electrical engineer, of the Beardsley Electric Company, have gone east to spend one month among the eastern factories to decide upon the construction of their product for the coming year, as well as make contracts for material.

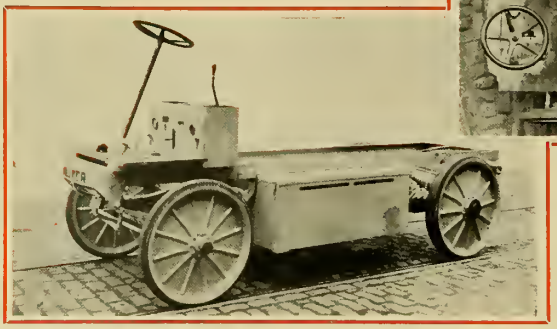
W. R. Jenny, who for the last two years has been factory representative for the Detroit Electric car in charge of sales in Indiana and Kentucky, with headquarters in Indianapolis, has been appointed traveling sales manager for the same company, with headquarters at the factory at Detroit, Mich.

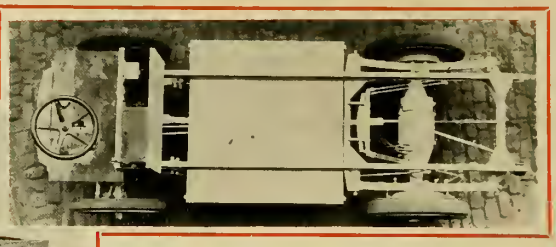
A. I. Butler, formerly manager of the branch of the Goodyear Tire & Rubber Company, Brooklyn, N. Y., is associated with the Batavia Rubber Company of New York, in the capacity of special representative in northern New York territory.

T. A. Willard, head of the Willard Storage Battery Company, Cleveland, O., recently tendered a banquet to 30 branch managers gathered from all parts of the country. The visitors spent a day at the plant. The Willard Storage Battery Company, Cleveland, O., will soon begin construction work on a new $35,000 plant. The building will be 200x135 feet.


EMC
ESTABLISHED 1907
PUBLISHER
TECHNICAL MAGAZINES
AND
TECHNICAL BOOKS

New Models of
WALKER ELECTRIC VEHICLES





This style chassis can be furnished in any capacity from 1,000 lbs. to 8,000 lbs.

WALKER VEHICLES should be investigated by every user of Commercial Vehicles. At least 75% of all city and suburban hauling and delivering can be done more economically and satisfactorily by Walker Electrics than by horse or gasoline vehicles, especially when stops are frequent.

Walker Electrics have a greater mileage capacity per day than the driver and the helper on all city work.

Let us know your service conditions and we will tell you frankly whether it will pay you to use Electrics.

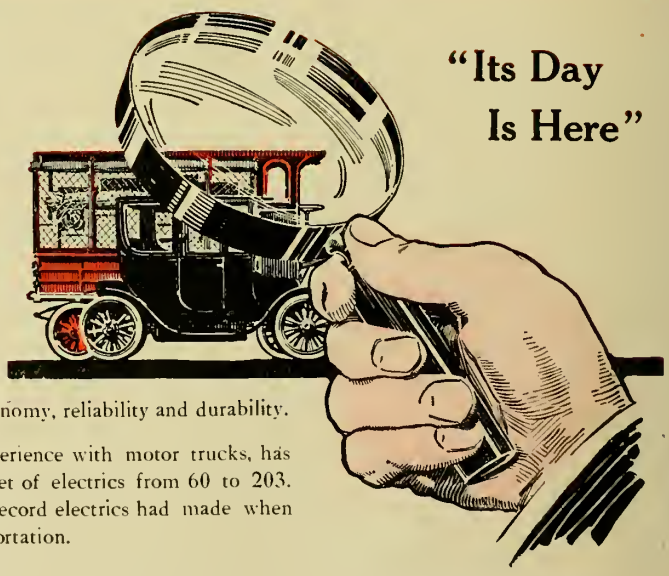
WALKER VEHICLE COMPANY

CHICAGO

More Walker Electric Vehicles have been sold in Chicago than any other make of either Gasoline or Electric Vehicle.

398

INVESTIGATE THE ELECTRIC



"Its Day Is Here"

TWO-THIRDS of the gasoline trucks in service today will be replaced by electrics; this is the statement of a transportation expert.

The man who half investigates and buys gasoline trucks will be forced by economy or competition to change to electrics. This is expensive and unnecessary, especially in view of the record made by electrics as to economy, reliability and durability.

One large Chicago firm of fourteen years experience with motor trucks, has in the last eighteen months increased their fleet of electrics from 60 to 203. This addition was made *only* because of the record electrics had made when compared with their other methods of transportation.

Whether you own one horse and wagon or a fleet of gasoline trucks — you should investigate the electric.

Our Vehicle Engineers are at the service of Chicago firms.

Commonwealth Edison Company

120 West Adams Street : : : Chicago

398A

ELECTRIC VEHICLES

Vol. 5 CHICAGO, DECEMBER, 1914 No. 6

A SOCIAL CALL IN RAUCH & LANG ELECTRICS


ANOTHER OF THE 4000 G.V. ELECTRICS
IN SERVICE IN 42 STATES AND ABROAD.
SEND FOR G.V. LITERATURE.
Globe-Wernicke Co.
Office Equipment.
FILING CABINETS
IN WOOD AND STEEL.
SECTIONAL BOOK-CASES.
DESKS, CHAIRS & TABLES.
380 BROADWAY.
GENERAL VEHICLE COMPANY, INC.
LONG ISLAND CITY, NEW YORK
NEW YORK—CHICAGO—BOSTON—PHILADELPHIA

Published Monthly By
ELECTRICITY MAGAZINE CORPORATION
Monadnock Building
CHICAGO

Entered at Chicago Post Office as Second Class Mail Matter

ELECTRIC VEHICLES

WITH WHICH IS INCORPORATED IGNITION
TRADE MARK REGISTERED IN THE UNITED STATES PATENT OFFICE

SUBSCRIPTION PRICE
Domestic - $1.50
Canada - - $1.75
Foreign - - $2.00

FOR SALE AT ALL NEWS STANDS

If Your News Dealer Will Not Supply You—Please Notify Us

Volume V | CHICAGO, DECEMBER, 1914 | Number 6

Advantages and Limits of Electric Trucks

Long Life, Simplicity of Operation, Improvea Batteries and Economy Overcome Initial Cost

BY MITCHELL MAY*

ELECTRICALLY propelled motor trucks using current from storage batteries have received attention since the earliest days of mechanically propelled vehicles upon the public highways. From that time improvements have been made in every direction. Batteries are better, and great care has been bestowed upon the design of the electric machinery, the motors, switch controlling and measuring and indicating instruments. Electric builders today have also many years of experience to guide them in the construction of gasoline motor trucks, so there is no reason why the chassis of an electric truck should not stand comparison with the best of the gasoline type.

An electric motor truck of a given power and load capacity generally costs much more than a gasoline motor truck, the higher cost being because of the fact that copper plays an important part in the construction of an electric motor and that, therefore, the material costs are disproportionate to the labor charges. Unfortunately, too, electrical engineers do not hold out much hope that this cost can be reduced very largely.

Another reason why the first cost is higher is that a second set of batteries must be held in stock, unless, of course, the user can arrange his runs so that the battery can be recharged during the mid-day stop or at other convenient times. But the electric vehicle has admitted advantages, and the question of first cost should not prevent business men from considering its merits.

Electric motor trucks have been built with a battery capacity sufficient to enable the machinery to run about 60 miles on one charge, although 40 miles is probably the longest distance that can be expected with a battery of reasonable weight and dimensions. Notwithstanding its limited range, however, the electric vehicle has undoubtedly a large field of useful application. It cannot do all that a gasoline vehicle can do, but it can do many things that a gasoline vehicle cannot do, and when comparing the construction of an electric motor vehicle with a gasoline or steam driven machine even the average layman can see that, from the mechanical point of view, it is by far the simplest of the three.

In an electric vehicle there is only one moving part, the armature, which drives one or more of the road wheels through gear wheels or chains. There are other moving parts in connection with the electrical apparatus, but these are moving only during the periods of control. The controller switch, for example, is not brought into operation except when a change of motor speed is required. In fact, the electric vehicle

*Secretary of State, New York.

A Fleet of Electric Trucks in the Service of the Philadelphia Electric Light Company.

is so simple in construction that any horse driver could be taught to drive it with all the appearance of a skilled driver after a week's instruction.

There have been frequent instances of firms changing over entirely from horse to electric motor trucks in a remarkably short space of time and without engaging a single new driver. In one instance, that of a large brewery in New York city, using 12 wagons wtih three to five tons capacity, and running from 35 to 45 miles per day, it is stated that one electrician and one assistant attend to the recharging of all the vehicles after their day's run and that those 12 electric vehicles displaced approximately double the number of horse-driven vehicles. This firm's engineer states that the pick of the horse drivers were taken off duty from their horse-driven vehicles on Friday night; that during Saturday and Sunday they received instruction in driving, and that on Monday morning they went out on delivery work with new electric trucks and had continued to work them with complete success, a prolonged and costly period of transition being thus avoided.

Apart from the unreliable nature of storage batteries for motor traction work ten years ago, the high charges for current and the lack of facilities for charging at the generating stations or garages undoubtedly helped to delay the coming of the electric motor vehicle. Now, however, current charges in this country are rapidly being reduced, although they are not yet as favorable as they might be. About 2 cents per kilowatt or even less is now being charged at various supply stations, and although the total charge for current has no more to do with the total cost of running the electric vehicle than has the full charge to the total running cost of a gasoline truck, the price of current must be low because of the known inefficiency of storage batteries.

On the other hand, avoidance of waste through running the motor while the vehicle is idle is eliminated, current being used only when the vehicle is actually traveling. In respect to the freedom from skidding, the electric motor truck is undoubtedly better than the ordinary types of gasoline or steam vehicles. The most common method of driving an electric vehicle is to provide each of the front wheels with a motor and reducing gear, these being carried and fastened on the axle so as to permit the wheels to steer as well as to drive. Consequently, whether on a straight road or curve, the traction power is always applied exactly in the direction of travel, as in the case with a vehicle driven around a curve by the back wheels.

It is possible to build a gasoline motor vehicle in which the steering wheel is also the driving wheel, and at least two very successful instances of this have long been before the motoring public, but the electric system certainly lends itself to the most simple arrangements of front drive, and for special circumstances power could be transmitted to all four wheels with perfect ease.

New York Reduces Charging Rates

It was announced at the Electrical Exposition and Motor Show that the New York Edison Company had reduced the minimum guarantee on its electric vehicle charging schedule from $25 to $10 per month. This is equivalent to an extension of what might be termed the wholesale rate enjoyed by owners of fleets of electric motor vehicles to the owner of a single vehicle and is certain to increase materially the use of electrics.

Under the present guarantee of $25 per month the operator of one car who would use in the neighborhood of 200 kilowatt hours per month would pay therefor at the rate of 9.5 cents per kilowatt hour, making his month bill $19. Under the new arrangement the same customer will get his 200 kilowatt hours of charging current at 5 cents per kilowatt hour, making his monthly bill $10. It will be evident that in the case of the small customer the reduction amounts to almost 50 per cent.

It is expected that this reduction in the cost of charging service will stimulate the sale of passenger cars and light delivery wagons to the small user who has heretofore objected to the minimum charge of $25 per month for current.

Exhibits Electrics at New York Show

Having resorted to every expedient to secure as much space in the huge Grand Central Palace as is possible, for the forthcoming fifteenth annual national automobile show, the management has ascertained that more than 150,000 feet of floor space will be available for exhibitors. The show is to open January 2, and will remain open the following week. With additional floor space available it means that the number of exhibitors will unquestionably break all records.

Not only will the gasoline car industry be represented in full force, but the makers of electric cars will occupy a large portion of the space. During the past week seven companies manufacturing electric vehicles were allotted space, including the American Electric Car Company, Saginaw, Mich.; Anderson Electric Car Co., Detroit, Mich.; Baker Motor Vehicle Company, Cleveland, Ohio; Ohio Electric Car Company, Toledo, Ohio; Rauch & Lang Carriage Company, Cleveland, Ohio; Waverley Company, Indianapolis, Ind.; and Woods Motor Vehicle Company of Chicago.

It has been decided by the show management to set aside one day this season to be known as society day, upon which the price of admission will be doubled. While ordinarily the admission is 50 cents it has been found desirable to have one dollar-admission day. Aside from it assuming the atmosphere of a social event, it brings out a class of people who are really interested in purchasing machines, and who are not merely curiosity seekers, of which there are a great number on the other days of the show. A great many prospective purchasers of cars prefer to attend the exposition when the crowd will be small, thereby affording a better opportunity for them to see the various models. Chicago's annual show will be held January 23-30.

Acid in Electrolyte Fatal

As a rule, owners of electric vehicles show their wisdom by leaving the care of the storage batteries to those who have had experience with them. But there are a few things that are of particular importance to those who either have to or want to do their own tinkering. One of them is to refrain from putting acid in the electrolyte to bring it up to the proper hydrometer test. A cell that tests too low in acid usually needs a long, slow "soaking" or overcharging, which has the effect of driving the acid out of the plates into the solution, and so bringing up the reading. Acid should not be added unless the reading can not otherwise be brought up.

Utilization of Kinetic Energy

Paper Read at the Fifth Annual Electric Vehicle Association Convention

BY T. H. SCHOEPE

THE electric vehicle, particularly the commercial truck, has not been used to any material extent in cities where many or steep grades are to be encountered, and this is due to two principal causes: First, the limited mileage per charge of the storage battery, and, second, the relatively low average speed which is reflected in the schedule speed. Greater mileage may be secured by increasing the capacity of the storage battery, and to a lesser extent by increasing the number of cells. Higher speed may be secured by increasing the number of cells and to a lesser extent by increasing the capacity, of the storage battery.

Hence, we are confronted by the necessity of increasing both the number of cells and the capacity of the storage battery, or substituting an equivalent in order that electric vehicles may be an economic institution in cities having many grades. The maximum number of cells is determined by the available charging voltage, and the maximum is now used in practically all vehicles. The capacity is determined by the limitations of physical space and weight, both of which are approached closely in present day practice. Each of these schemes increases materially the cost of the vehicle.

Therefore, we turn naturally to the simplest equivalent—frequent boosting—which is limited, due to lack of properly equipped stations, and requires considerable time, during which the truck might be used in its earning capacity.

Boosting the charge of the storage batery during the time the truck is standing at the loading stations is sound in principle and economic; which, augmented by charging when the truck is under way, approaches the ideal. The latter means the utilization of the energy stored in the vehicle by virtue of its weight and speed—regeneration.

Regeneration has been more or less discredited because shunt wound, or at best, compound wound motors were used in the past, thereby sacrificing the desired characteristics of a series wound motor to obtain the characteristics of a shunt wound machine when regenerating. Furthermore, regeneration was used to bring the vehicle to a standstill, which resulted in abuse and injury to the electrical equipment and transmission system. It will be recognized readily that the machine can be given the characteristics of a series motor and a shunt generator by the use of excessive materials, or by the introduction of some feature exterior to the motor. The latter scheme was employed for the tests outlined herein, a standard truck and its equipment being used with the addition of three cells of storage battery connected in parallel circuit with the fields of the normal series motor when regenerating, and a slight modification of the contacts on the controller drum.

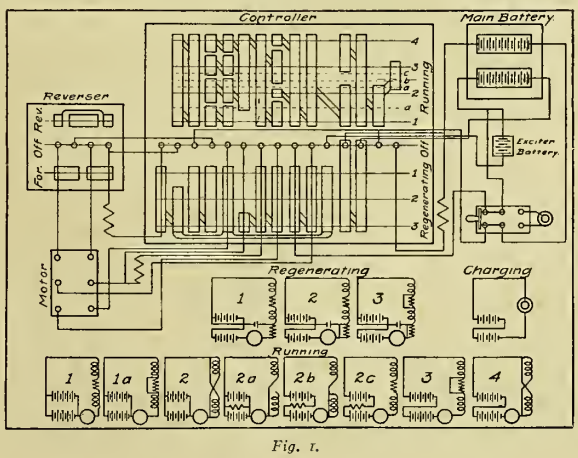


Fig. 1.

Fig. 1 shows the outline of the connections. The upper part shows the various pieces of apparatus and the electrical connections between them. The lower part shows the schematic connections when the controller is in the various positions for running, regenerating and charging. It will be observed that the connections in the running positions conform strictly to orthodox practice in that the main battery is divided into two equal groups connected first in parallel and then in series, the transition being secured without interrupting the supply of current to the motor.

Fig. 2 shows to larger scale, and, therefore, more clearly, the three principal or economic, running positions; the first position may be used to maintain a steering headway operating in zones of congested traffic.

When the controller drum is rotated from the "off" position and in an opposite sense from this position, connections are established whereby regeneration may be effected. Provision was made for three regenerating positions having graduated degrees of retarding efforts. However, no intention was entertained of providing for electric or dynamic braking other than the reasonable control of speed when descending grades, which I think is the only basis on which regeneration may be employed on electric vehicles and attended by commercial success. In the tests, all braking with the desire to check suddenly the speed of the car, or bring the car to a full stop, was done through the mechanical brakes, and the dynamic brake was used to control the speed of the car when descending grades and thus reclaim the kinetic energy of the car. Fig. 3 shows the schematic arrangement for the first position of the controller when regenerating. Fig. 4 for the second position, and Fig. 5 for the third position. The directional flow of the current in the various branches of the circuit is illustrated by the arrows, and the actual distribution for certain conditions is shown by the numerals, which indicate amperes; those above the line are for one set of conditions and those below the line for another different set.

One of the electric trucks used regularly in the works' service was equipped specially for the tests.

The truck characteristics were accurately kept and are as follows:

Weight fully equipped, in pounds	5,000
Weight of observers, in pounds	385
Total service weight, in pounds	5,385
Wheel diameter, in inches	32
Gear ratio	8.87 :1

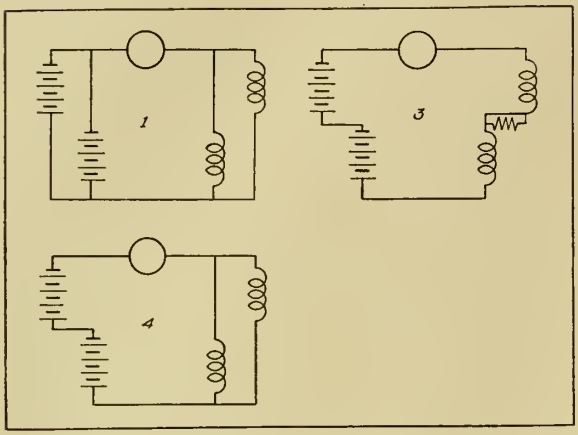


Fig. 2.

The equipment comprised the following:

1. One motor rated at 80 volts, 25 amperes, 1,450 r. p. m., and weighing 190 pounds. The performance characteristics are shown in Fig. 6.
2. One main battery of 44 cells of 11 plate MV "Ironclad-Exide."
3. One exciter battery of 3 cells of same capacity and make.
4. One controller and reverser.
5. One main switch and charging receptacle.
6. Two ampere hour meters to show true ampere hour input and output connected in the circuit, as shown in Fig. 3.
7. Two ampere meters connected as shown in Fig. 3.

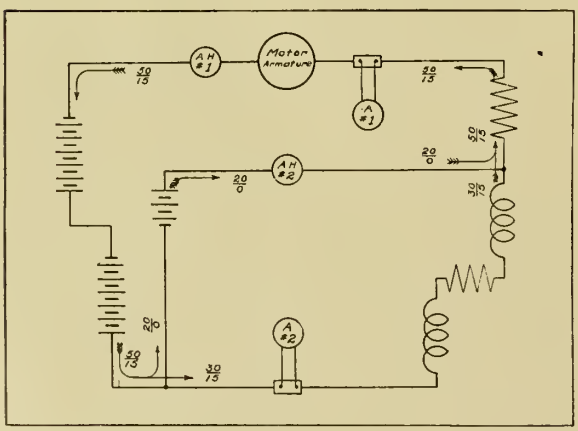


Fig. 3.

8. One voltmeter, not shown, but connected across the terminals of the main battery.
9. One set of resistance connected as shown in the schematic part of Fig. 1.
10. One hub type odometer.

Preliminary runs were made in order to get everything into proper adjustment, and allow the observers to become familiar with their duties.

Carefully planned runs were then made over selected routes, as shown in Fig. 7.

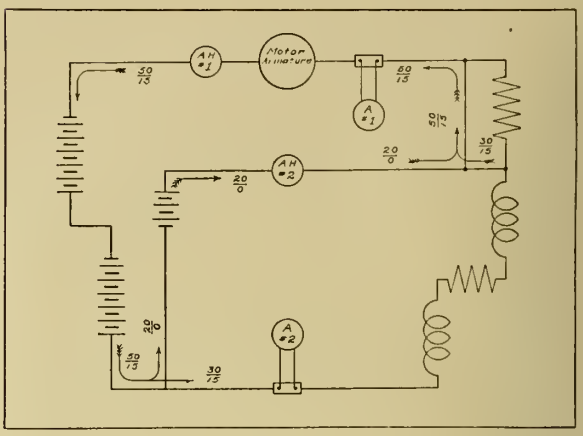


Fig. 4.

The results of four runs are shown in the tabulation herein:

Run number	*1*	*2*	*3*	*4*
Distance in miles	33.6	33.6	28.7	28.7
Time in seconds actually running	12,295.0	11,630.0	10,505.0	9,985.0
Time in seconds including stops	15,850.0	13,490.0	13,610.0	11,845.0
Average speed in m. p. h.	9.83	10.4	9.84	10.35
Schedule speed in m. p. h.	7.64	8.95	7.58	8.96
Ampere hours by meter	141.0	120.0	125.0	107.0
Ampere hours, calculated	139.13	121.51	122.3	108.0
Average voltage	76.4	82.5	79.0	80.6
Watt hours, total	9,894.0	9,647.0	8,901.5	8,727.4
Watt hours, per ton mile	109.0	106.6	115.0	113.0
Watt hours, per car mile	294.0	287.0	310.0	304.0
Ampere hours regenerated	.....	16.3	.....	14.3
Root mean square amperes	47.7	54.0	48.0	54.5

Runs No. 1 and No. 2 were over the same route and under the same conditions as regards charge in the storage battery, road surface and weather; No. 1 was without regeneration and No. 2 was with regeneration.

Runs No. 3 and No. 4 were over the same route and under the same conditions as regards charge in the storage battery, road surface and weather; No. 3

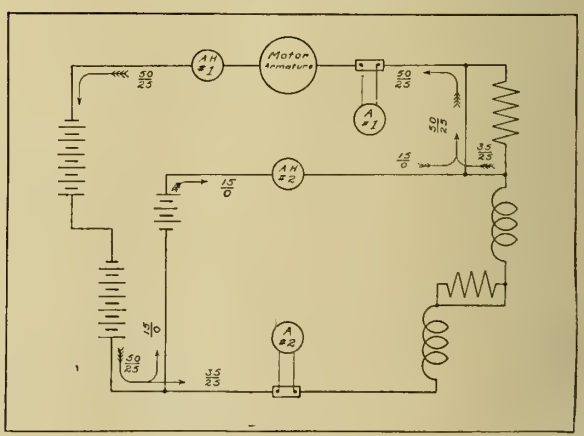


Fig. 5.

was without regeneration and No. 4 was with regeneration.

Due to the local conditions, runs No. 2 and No. 4 were not continued until the charge in the battery was completely exhausted, so that it was not determined how many additional car miles could be run by virtue of the regeneration, but these were calculated carefully and found to be 4.64 miles and 3.75 miles respectively.

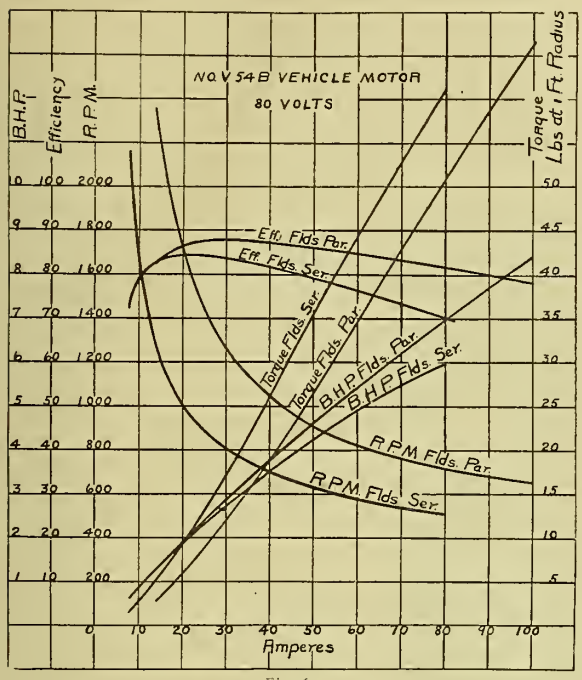


Fig. 6.

In conclusion, in cities where many or steep hills are encountered, regeneration, as effected in the foregoing scheme, will result in the following advantages:

1. Reclaiming and putting into useful work the kinetic energy of the vehicle which, otherwise, would have to be absorbed or dissipated by the mechanical brakes.
2. Increase in car miles per charge of battery.
3. Increase in average volts across the battery terminals.
4. Increase in average running speed and, therefore, increase in schedule speed.

All of which advantages may be secured by the addition of one or two contacts to any standard controller, and two or three cells of storage battery to any standard truck now in service.

Electric Automobile Manufacturers Elect New Officers

At a special meeting of the Electric Automobile Manufacturers' Association, held in Cleveland November 18, G. D. Fairgrieve of the Anderson Electric Car Company was elected treasurer, and E. P. Chalfant was elected secretary to succeed E. H. Dodge resigned, who was formerly secretary and treasurer.

L. E. Burr, president of the Electric Automobile Manufacturers' Association and president of the Woods Electric Company, takes an optimistic view of the business situation as it affects the electric car industry. The electric is becoming more and more popular, said Mr. Burr, and the members of our Association are well pleased with the business we have been securing, considering the difficulties we have had to contend with.

The great conveniences and many advantages of the electric car are becoming more and more realized, and this, in connection with the great improvement recently made in the appearance and efficiency of electric cars, has had a very good effect upon sales. This is especially true in the middle west which, so far, has been the greatest strong-hold of the electric car.

Fig. 7.

Charging Apparatus for Private Garages

Paper Read at the Convention of the Electric Vehicle Association

BY J. F. LINCOLN

THE importance of properly charging the battery used in pleasure vehicles cannot be overestimated. The mere fact that the difference between proper and improper charging of the battery will make the difference between a total mileage life of over 15,000 and any fraction of this makes this fact easily appreciated. The actual results which are gotten by the usual method of charging at present are not perfect.

The reasons for this are the charging requirements of the lead battery, which requires a definite cycle of operations to properly and completely charge it and also on account of the fact that most charging is done at night when no attendance is possible, making it necessary to have automatic devices to take care of the cycle of operations mentioned above. The characteristics of the battery as affects its charging are the following:

First, all lead batteries when charged above a certain rate called the gassing rate will tend to throw down to the bottom of the jar active material, thus reducing its total life in the same proportion that this throwing down goes on. This gassing occurs only at extremely high rates when the battery is discharged and at rapidly reduced rates as the charge goes on until when the battery is fully charged it will occur at very low values of charging current. This means that the successful charging plant must automatically give a tapering charge in order to eliminate excessive gassing.

Lincoln Electric Charging Equipment.

The second feature which must be very carefully watched and which may result in rapid depreciation of the battery is heating during charge. If the temperature of the battery runs up above 110° F. the plates soften. This results in deterioration of the battery, which, if continued, will materially shorten its life.

The third difficulty, as mentioned above, is the fact that charging must generally be done at night and in the private garage therefore it must be done by apparatus which will automatically give the required cycle of charging rates. It is not only necessary that the charge should be tapered or stopped automatically, but the charging set must do this without any possibility of harming the battery, no matter what accidents may occur.

The fourth handicap that the battery is working under in the usual private garage is the fact that the attendant is generally both unskilled and apt to disregard instructions or translate them improperly.

Because of these difficulties the charging apparatus must have a great many automatic features in order to successfully give the battery the proper tapering charge and always keep it below the excessive gassing rate and at the same time do this without the necessity of any attention.

Up to the present time, I think all admit that a charger which will automatically perform this cycle of operations without attention has not been in common use.

The apparatus which has frequently been used for charging in the private garage is the mercury arc rectifier. This instrument depends for its converting properties on the valve-like action of a glass tube with the proper electrode which allows current from an alternating current source to flow in one direction only. This instrument has been carefully developed by two of the largest electrical manufacturing concerns in the country, is of neat appearance, of high efficiency, and except for the fact that its voltage and current characteristics are not best suited to the charging of lead batteries, has considerable application. The difficulties with this instrument in connection with the charging in the private garage are the following:

It depends for its cut-off, that is, the termination of the charge on the rising of the battery voltage to equal the line voltage. This makes the cut-off dependent not only on the battery voltage, which cannot be safely relied upon as a means of cut-off, but it also makes the termination of the charge dependent upon the fluctuation of the line voltage. This means that a rising of the line voltage after the battery is put on charge will result in an overcharged and damaged battery while a lowering of the line voltage will result in a battery only partially charged, which will finally sulphate, besides inconveniencing the user. When we remember that voltage fluctuation above and below a mean point sufficient to cause either of these contingencies, is very frequent, particularly on long lines, it is easy to see why this method of cut-off cannot be made dependable. This limitation of the rectifier is so well understood that it is very seldom that the voltage cut-off is depended upon for giving the battery a complete charge without attention. Generally the battery is put on at a rate which will make it certain that it will cut off before a complete charge is put in and the charge is complete sometimes when the battery can be carefully watched.

The glass tube of the rectifier deteriorates with use and must be periodically renewed. The guarantee of 300 house' use put on these tubes by the manufacturers will give some idea as to their life, and this source of expense has a very appreciable bearing on the total cost of charging.

The rectifier cannot be used with the usual size of pleasure car battery at the rates at which the charge should be finished or at which the overcharging should be

given. A rate of 10 or 12 amperes is the lowest stable rate which the tube will maintain under the usual voltage conditions as found in usual residence districts. This rate is altogether too high for the finishing of the charge and results in injurious gassing to the battery each time a charge is completed.

There are other devices on the market notably a rotary converter of very ingenious design and also motor generator sets of good construction and design both of which, however, depend on the same features for cut off as the rectifier, that is, the increasing of the battery voltage.

Since the battery voltage is dependent upon a number of various phenomena, among which is the age of the battery, temperature, condition of the plates as regards sulphate, specific gravity of the various cells, short circuited cells or partially short circuited cells and drop in the charging lines, it is quite evident that any device which depends on voltage for cut-off cannot be made reliable. When it is also remembered that very often battery voltage will rise to its maximum point before the battery is completely charged, and under extreme conditions will even rise above its maximum charged voltage before 10 per cent of the charge is put in, it is easy to understand why difficulties with this scheme are frequent.

Specific gravity of the electrolyte is the most reliable method of determining the condition of the charge of lead cells.

When we also take into consideration the fact that a battery may be ruined in a comparatively short time by improper charging so that its life will be cut down to a fraction of what it would be under proper conditions, it is easy to see why these automatic devices, dependent on battery voltage which when properly handled are beautiful in their action, yet when improperly handled, as they are very apt to be in the usual private garage, become a positive menace.

Let us consider what the ideal charging plant for the private garage would be.

First, it is essential that the plant put into the private garage first of all should not require attention. I say that advisedly from my experience with probably three or four thousand privately charged batteries and their operation. It is a fact that as a general thing if there is anything to be done by the operator of the private garage, it will be done wrong sometime.

Second, the plant also must be of such a construction that no matter how long the battery is left without attention the plant will not damage the battery.

Third, the charger must be of such a type that it will put in a complete charge without any attention and do this within the time which is usually given over to charging, so that the car may be completely charged when next required.

Fourth, it must be able to charge the battery throughout the complete charge and overcharge without harmful gassing. I think that the battery manufacturers have enlarged on this point so that the mere statement of this fact is accepted without question. There is not the slightest doubt that gassing, particularly violent gassing, is probably the most harmful thing which is usually done to a lead battery.

Fifth, the battery also must without attention be fully charged and the temperature of the battery must not rise above 110° F. This often becomes a difficult matter in warm places, especially after the battery has been used immediately before it is put on charge.

Sixth, there must be no depreciation of the charging apparatus which will necessitate the replacing of the parts on it, or if such replacements are necessary they must be at very long intervals and must be of such a nature that they may be made by the usual electrician without much cost to the owner and without delay.

Seventh, the cost of the plant must be small.

Eighth, overcharging with the charging apparatus should be automatic and should be complete enough so as to eliminate the possibility of the plates sulphating.

Ninth, the efficiency of the outfit, that is, the charging cost, all features being taken into consideration, should be high enough so as to make the burden of charging current cost as small as possible.

We have now described what I believe all will agree would be an ideal charging plant. I will now describe the outfit which, I believe, comes closer to fulfilling these requirements than anything else which has been put on the market.

The Lincoln electric charger is a motor generator set made two bearing, the two bearings being self-aligning SKF ball bearings of ample size. The set itself is extremely compact and light in weight, has been designed particularly for efficiency and power factor, both of which characteristics are unusually high for the size of the machines. The set operates at 1,800 revolutions per minute for 60 cycle supply and 1,500 revolutions per minute for 25 cycle supply. The motor is a single-phase non-starting induction motor with a very low resistance squirrel cage winding. The generator is a two pole interpolar machine compound wound with a characteristic which approaches as closely as is possible for the size of the machine and work to be done, a constant voltage generator. There is furnished with this outfit and wired to it, a steel cabinet in which is mounted a standard knife switch with a number of special jaws for complete control of the apparatus and so arranged that the following sequence of events takes place as the switch is closed.

First, the shunt field is closed from the battery, thus exciting the shunt field fully. The second contact is a short circuit on the series field and the closing of the armature circuit across the battery. This allows the set to run up to practically synchronous speed, the generator acting as a motor supplied by current from the battery. The third contact is the closing of the motor leads to the alternating current supply. The fourth contact opens the short circuit on the series field. All of these contacts are made by merely closing the four-pole switch mentioned.

These sets are sent out with all wiring between the switch box and set completely in place. All that is necessary to do in installing the outfit is to screw the cabinet to the wall and connect the two leads from the alternating current supply line into two lugs in the switch box and connect the charging plug to the charging cable which is furnished and connected properly. The set then is ready for operation. By a special construction of the outfit it is impossible to connect the charging plug wrong, no matter how it is attached or if it is connected in and then taken off and reversed the set will still operate satisfactorily and the series field will still remain connected in the proper direction.

The characteristics of this outfit are as follows:

Because of the special construction of the magnetic circuit and on account of the compound winding, the starting rate is up to the maximum capacity of the set, on a totally discharged battery. As the charge goes on, the counter electro motive force of the battery rises, thus decreasing the charging rate. This, however, after the first hour comes to a nearly constant rate and a very large

part of the charge will be put in at a rate of approximately 1½ amperes per plate. In other words, on a thirteen-plate battery the most of the charge will be put in at a practically constant rate between 20 and 17 amperes. When approximately 85 per cent of the charge is put into the battery, this rate begins to rapidly decrease as the battery voltage again starts to rise rapidly and when the battery is completely charged, this rate will drop to less than ½ ampere per plate, or in the same thirteen-plate battery mentioned above, approximately 6 amperes. If the charge is continued beyond this point, this same 6 amperes or less will continue to flow into the battery until it is manually cut off.

A full battery charge takes approximately twelve hours. It is seldom that a full charge is needed as some of the previous charge is usually left in the battery when it is again put on charge. However, no matter if the battery is left on charge for any reasonable length of time after it is completely charged, it will not be damaged by the very low rate mentioned. This low finishing rate has another advantage, it converts any sulphate which may be present on the plates.

The charger is so arranged that in case of short circuit, open circuit, grounded circuit or failure of the line voltage, it automatically takes care of itself.

From the description of this machine and from the description of its operation, it is evident that there is nothing automatic which must be adjusted nor are there any adjustments necessary for the use of this machine in actual service. There is no reason why this set cannot be put into service and remain in service for years without the necessity of adjustments or repairs with the one possible exception that once a year the grease in the bearings should be changed and there may be the necessity of a new set of brushes at the same time.

There are no accidents which can occur which will make it possible for destructive overcharging to take place as is the case with a tube rectifier, where a rise of voltage on the supply line may result in the heating of the battery or where a drop of voltage in the supply line will result in an incomplete or practically no charge of the battery.

Now let us consider the point which really in the last analysis determines the relative values of this or any other charging instruments, that is, the total cost of charging, including current cost, depreciation of the charger and depreciation of the battery caused by the charger.

The cost of charging is made up of three items.

First, cost of current; second, depreciation of the charging plant; third, battery depreciation caused by charging.

To get the total cost of charging, let us assume a standard equipment as follows:

Battery to be 40 cells 13 plate; average miles per charge, 80; ampere hours input for full charge, 180; battery cost $250.00; cost of current, 4 cents per kilowatt hour.

First, let us consider the current cost for charging this equipment with the rectifier and also with the Lincoln charger. The electrical efficiency of the Lincoln charger is about 10 per cent less than is the efficiency of the rectifier. This will make the cost of a complete charge on the above equipment 86 cents with the mercury arc rectifier and 96 cents with the Lincoln charger, or a cost per mile of $0.0108 as compared with $0.012 per mile.

Second, the depreciation of the charging plant.

It is evident from the description of the Lincoln charger, that the depreciation will be extremely small. Five per cent a year will cover this, without doubt, which amount is negligible; in fact, the depreciation of the rectifier outside of the tube, would be equally as great if not greater. The tube depreciation of the rectifier would be 7 cents per hour taking the present-day guarantee as to tube life and cost as a basis. This amounts to approximately 52 cents per charge, or 0.0066 cents per mile.

Third, the deciding factor, however, is not the cost of current or the depreciation of the charging equipment, but is the battery depreciation, which in comparison with the other two items, is large enough to almost disregard them.

A battery charged with the rectifier under usual conditions must finish at a rate of from 10 to 12 amperes unless closely watched, as this is the lowest stable rate which can be maintained under average conditions of voltage regulation in the usual residence section. Close watching, of course, at night is impossible, therefore, this is the finishing rate which is actually used by all rectifier-charged batteries. This rate will badly gas the usual size of pleasure vehicle battery when fully charged and will shorten its life on this account. In warm weather it is impossible to complete the charge of a lead battery at these rates without overheating it and softening the plates, besides causing the deterioration spoken of on account of gassing. Because of these facts, the average life of the rectifier-charged battery will not average in excess of 7,500 miles. This is the result of data compiled from the life records of several hundred rectifier-charged batteries. The average life of a battery charged on a non-gassing and non-heating schedule will be at least 15,000 miles as shown by life records of batteries charged under these conditions. Any battery manufacturer, I am told, would be willing to guarantee such a life record providing the user can guarantee to him that the battery will never be gassed under charge nor the temperature rise above the specified limits.

With these facts as a basis, the average depreciation of the battery on a basis of 7,500 miles is 3 1-3 cents per mile. With 15,000 miles as a basis, the battery depreciation becomes 1.7 cents per mile. Taking all costs, therefore, together, the cost of charging by the use of the rectifier becomes approximately 5.1 cents per mile as compared with the electric charger cost of 2.87 cents.

It may be interesting to give the experience of the writer with his own electric car in connection with charging. I have been driving for three years a model 18 Detroit roadster equipped with 24 cells of 11 plate Philadelphia battery. During the first year I had accidents which have resulted in broken jars, and at that time I had the battery pretty carefully looked after, as each time a new jar was put in by the person who made the replacement the gravity of the cells was evened up. However, in the last two years the gravity of these cells has not been taken and they have received no attention outside of the charging which was necessary. I am at the present time getting about 75 per cent of the mileage which I got the first year at the maximum point. I have driven this car over 11,000 miles, and as already stated, the battery has had no attention, although the time is approaching when I ought to have the battery washed. There is not the slightest doubt that the mileage life of this battery will be in excess of 15,000 miles, and there is also no doubt that the reason for this is the fact that the battery has never been warm under charge and has also never gassed under charge.

Special Delivery Trucks for Bakers

Specifications and Construction of the New Ward Special Electric

FOR a long time it has been a settled question with most bakers that motor vehicle delivery of bread is not only the ideal method for transporting their product from bakery to retailer, but also a modern necessity, a business economy, and an advertising asset. The large baking companies of the country which have to a great extent superseded horse and wagon delivery with motor bread wagons, have declared more than once that a large percentage of new and increased business can be credited to this new factor in the industry, which has enabled them to render better service and do away with that most unsatisfactory feature — horses and stables.

"Ward Special," for Bakers.

And now comes the announcement of an electric vehicle to be built on a standard of quality to give high efficiency in service and economy in upkeep, which will be sold at a price so low that there is hardly a baker in any part of the country who need be without this modern method of bread delivery.

This new car is known as the Ward special, and will be built by the Ward Motor Vehicle Company of Mount Vernon, N. Y., a concern which has built many electric motor vehicles for most of the leading bakers of the country.

Notwithstanding its popular price, this new car will contain in all points of its construction the same high standards which have built up an enviable reputation for all Ward motor vehicles. Its features will include Timken axles, Westinghouse motor, shaft drive, 32x2½-inch tires, artillery type wheels, and wheel steer with steering column control. It will have a capacity of 750 pounds, and a mileage radius of 35 to 45 miles per charge. Its most remarkable feature, however, is the price, which has been placed at $875, a figure which is about 35 per cent lower than the lowest price ever quoted before for an electric delivery vehicle of this character.

It is the intention of the Ward Motor Vehicle Company to manufacture the Ward special in large quantities, and for that purpose it has just completed the building of a new manufacturing plant at Mount Vernon, N. Y. This new plant is a model of its kind, and has been planned to permit of the manufacture of the Ward special and all the various types of cars made by the company, under conditions which will provide economy in manufacturing cost, as well as speed and systematic assembling. The plant will have a capacity of 3,000 cars per year. It is 162 feet wide by 302 feet long. A private freight siding runs right into the stock room so that all material can be wheeled direct into the stock room and then down the wide aisles measuring 40 feet wide by 250 feet long, distributing the materials to the different departments.

The general offices of the Ward Motor Vehicle Company will be located at the Mount Vernon plant. A show room has been opened in New York City at 101 Park avenue, corner of 40th street.

The first introduction of the new Ward truck was made at the recent Electric Vehicle Show held at the Grand Central Palace, New York City. The car was one of the sensations of the show and attracted widespread attention, not only from visitors, but also from exhibitors of other motor vehicles.

The present manufacturing plans of the Ward Company contemplate the building of 500 Ward specials during this season, and it is said that just as soon as bakers and other merchants realize the delivery opportunity the light electric offers, there will be a great demand for vehicles in this particular service.

Waverley Trucks for the Government

The Waverley Company of Indianapolis has under construction for the Navy Yard on Puget Sound, Washington, a three ton electric shop truck with three ton trailer for handling plates and angles from storage to machines and from machine to machine through the naval repair shop.

The tractor is of unusual design in that with a wheel base of sixty-six inches the platform of the car is five feet by eleven feet, the principal overhang being in front of the front axle.

The battery of forty-two cells is divided between two battery boxes, one between the wheels and the other under the forward overhang.

Mounted on the platform of each car is a turntable five feet two inches in diameter running on rollers and operated by hand spikes for the quick and convenient unloading of the heavy plates or beams it is designed to carry.

The construction of both cars is very substantial, wheels, axles, frames, turntables and all being of heavy steel. A single motor is used and the power is transmitted to the rear axle by means of a worm gear shaft drive.

A mileage of thirty miles on a single charge of the battery is provided and a speed of five and one-half miles an hour with both cars fully loaded.

The use of separate shop truck and trailer gives great loading capacity for car of very short wheel base, and admits of making short turns in narrow runways.

With suitable floors and pavements electric shop trucks and trailers would have a large field of usefulness in many factories not at present provided with them.

Assembling Motors on Chasses.

Bodies Being Covered with Sheets of Aluminum.

Finishing and Testing Front Axles.

Upholsterers Shaping the Fabric for Interior Linings.

Drilling Front Axles.

All Cars Are Tested Before Leaving the Factory.

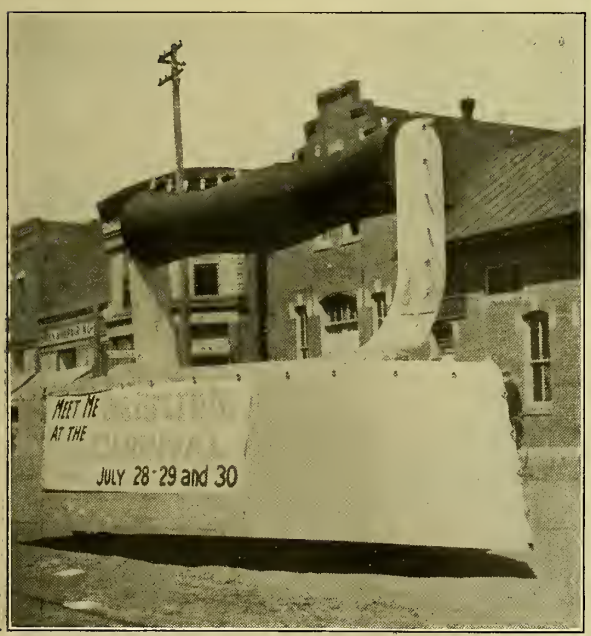
Various Stages in the Construction of Electric Passenger Vehicles.

STORIES IN PICTURES OF ELECTRIC VEHICLE PROGRESS AND DEVELOPMENT.

Ohio Electric Chassis Climbing a Hill with a Grade of 28½ Per Cent. The Car Carried Three Passengers and Easily Negotiated the Incline, Even Over a Bad Road Course. The Car Was Equipped with Lead Batteries.

Waverley Electric, a Prize Winner in the New York Tercentennary Parade Held October 31. Float Represented a Huge Pumpkin, the Lighting Effects Being Secured Directly from the Battery Causing Considerable Comment from By-standers.

Waverley Electric En Route on Run from Washington to Baltimore. Photograph Was Taken at the Foot of Relay Hill, Relay. This Hill Is Exceedingly Steep and One and a Half Miles Long, Over an Excellent Road Course.



During a Recent Electric Carnival Promoted by the Walsenburg, Colo., Lighting Company, an Electric Truck Chassis Was Decorated to Appear as a Flat Iron Advertising the Advantages of Electric Irons, and Announcing the Electric Carnival.

Electric Battery Trucks Are Being Used Extensively for Interior Hauling at Wharfs, Docks, Factories, Railroad Stations, etc., and Eliminate Labor and Expense at a Saving of Forty Per Cent Over Former Methods.

STORIES IN PICTURES OF ELECTRIC VEHICLE PROGRESS AND DEVELOPMENT.

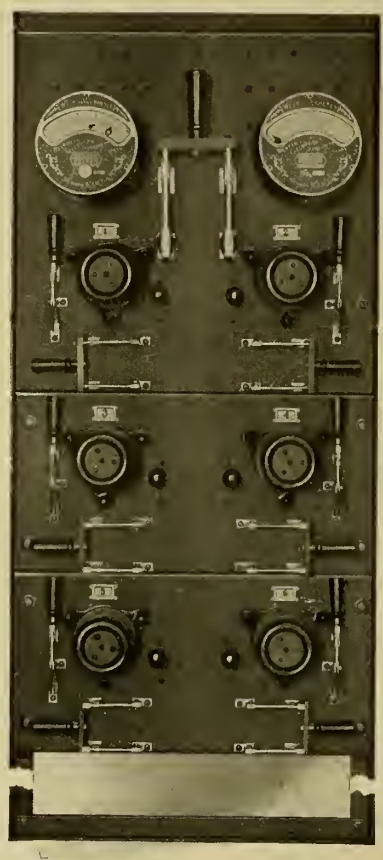
Unit Type Battery Charging Switchboard

Description of the Allen-Bradley Charging Apparatus for Garages

BY C. D. BAIRD

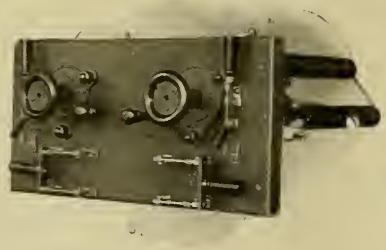
A BATTERY charging switchboard for garage purposes, which, although extremely compact, is simple in construction and very easy to operate, has been placed upon the market by the Allen-Bradley Company of Milwaukee, Wisconsin. These switchboards were designed with the view of obtaining the greatest possible convenience, compactness and durability, and, at the same time, to be able to withstand the most critical inspection.

The above illustration shows a battery charging panel complete with six charging stations to which four more can be added without unduly increasing the height of the board thus making it awkward for the garage attendant to operate the same. It is built up according to the unit system which embodies the sectional bookcase idea. When complete, the Allen-Bradley switchboard consists of one instrument panel and four unit rheostat panels. The instrument panel includes the main line switch, a voltmeter and an ammeter, two battery charging rheostats, the main distributing fuse panel, the wrought angle iron frame and floor supports, and the necessary switches, conductors, etc. A unit rheostat panel, a cut of which is herewith shown, includes two battery charging rheostats and the necessary switches, fuses, etc., besides the proper screws for fastening the slate panel to the wrought iron frame or support of the instrument panel.



A Unit Rheostat Panel Complete with Necessary Switches, Voltmeter, Push Buttons and Two Charging Rheostats.

The instrument panel alone may be purchased first and additional unit rheostat panels can be easily added later on as necessities require. Such an arrangement is truly ideal as it not only permits the small garage to purchase a standard equipment, but also provides for its future growth. In like manner the large garage is benefited by the same. Formerly, when the capacity of its board had been reached and it was desired that the charging equipment be uniform, it was necessary to purchase a complete, many-circuit board, whereas one or two additional charging rheostats would have satisfied the immediate demands. This involved a large idle investment which is now eliminated, since the charging switchboard can grow with the business.



Allen-Bradley Unit Type Switchboard.

These switchboards are built in two different standard sizes, one having 60 amperes capacity; the other 100 amperes capacity. The extreme dimensions of the 60 ampere board are 2 ft. by 7 ft., while the 100 ampere board is somewhat wider, namely 3 ft. by 7 ft. The height of the operator's reach, however, is never above 5½ feet.

The battery charging rheostats used are of the well known graphite compression resistance type, which are very compact, control the current perfectly and eliminate all complicated wiring, face plate segments, sliding contact, etc., which are inherent and objectionable features of the old form of wire wound or grid type chargers. The range of the Allen-Bradley battery charger is very great and any number of cells, from one, up to the maximum permitted by the voltage of the supply circuit, may be charged with a single rheostat. As the resistance of these rheostats is not varied by the cuting in and out of resistance units by means of a contact arm and segments, but is dependent upon the pressure applied, the current may be set exactly at any desired value, regardless of the number of cells being charged, and may be raised or lowered gradually, without the characteristic "steps" of other rheostats. This feature is of great importance in battery charging work as it saves the life of the battery and also gives the rheostat greater lattitude.

The compression type rheostats have come into popular use, and many modern garages, both large and small, are either equipped with the switchboard complete or have an installation of Allen-Bradley vehicle battery charging rheostats.

Increasing demands for charging service has become a considerable problem to garagemen. Practically every electric garage in our large cities is filled to its capacity. Garages formerly catering to gas cars are evincing an interest in this new branch of the industry and naturally new charging apparatus is included in the many prominent included in the many prominent considerations of the modern equipped garage.

Electric vehicle sales will without a doubt increase each year and garages should make special efforts to equip their stations to supply the demand.

Operating Records Committee Report

Presented to the Fifth Annual Convention of the E. V. A.

AN endeavor has been made during the year to collect some contrasting information upon the relative cost of operating electric and gasoline passenger vehicles in the service of owners who employ both types. We have prevailed upon a number of our manufacturers to invite this information from many of their customers who, having both types, might be in a position to supply this. However, most of these owners are not sufficiently interested in the cost involved to warrant their keeping the records we desired and in consequence we have not been able to develop any data for presentation at this time. The project has been started and we expect to continue our efforts in this direction until we establish figures which will be as useful to the passenger car division of the industry as the table presented herewith has been to those interested in the commercial vehicle.—Respectfully submitted, William P. Kennedy, *chairman*, S. C. Harris, E. W. Curtis, Jr., E. L. Callahan, F. F. Phillips, D. F. Tobias

ADVANTAGES AND SUPERIORITIES.

In making comparison between electric and gasoline types of motor vehicles, it is well to recognize that both have their special fields of application, and that the internal combustion prime mover is bound to monopolize lines of work entirely beyond any reasonable application of the electric machine.

Little will here be said regarding advantages of the electric pleasure vehicle since these are well known and many of them are common to the commercial type which will be more forcibly accentuated in the following subject matter.

The electric machine for the transportation of merchandise has, among others, the following advantages:

Its power equipment may be provided in accordance with the daily work to be performed, and this work can be measured and recorded in advance of the selection or purchase of machines.

Any speed consistent with traffic conditions may be arranged for.

The moving mechanism is all rotary (not reciprocating), and is reduced to the least number of parts practicable in a motor vehicle.

The facility and ease of control in congested traffic districts practically assures automatic adjustment of power to the varying load and desirable changes of speed.

Skilled mechanical labor is not required for operation, so that in any change from animal to mechanical transportation the same labor force (accustomed and willing to continue the routine loading, delivering, etc.), may be retained and employed for machine operation.

One skilled mechanic with the ordinary quality of help can care for a large number of machines, and the maximum economy of any installation will result with the use of the maximum number which he can efficiently care for.

With proper relaying of batteries, either at the home station or sub-stations, any desired radius of action may may be obtained.

The power plant of the machine can be utilized to operate suitable devices for loading and unloading and the performances of other work.

Electric machines may be used on steamship docks and elsewhere, not being restricted by insurance regulations.

When the machine stops, its operating cost ceases (except overhead charges) and the power consumed is in direct proportion to the work performed.

One peculiarity of the electric machine which should be emphasized in dealing with those who have been accustomed to horse service, is that the consumption of energy, tires, gears and battery material, is in direct proportion to the work performed, and that periodical renewal of such consumed material is as much an essential part of the service rendered as is the renewal of horse shoes, wheel tires, feed, blankets, or any other similar material requiring constant renewal with horse maintenance. The periodical renewal of this consumed material has been regarded by those unaccustomed to analysis, as the gradual breakdown or depreciation of the entire machine, whereas the machine proper undergoes very slight wear, the annual depreciation being somewhere between 5 per cent and 10 per cent.

The user has available in almost any locality one or all of four organizations as sources of assistance and information: the manufacturer of the complete vehicle, the manufacturer of the motor and electric appliances, the manufacturer of the battery, and the local central station company.

CENTRAL STATION ASSISTANCE.

The principal lines upon which central station men can most rationally aid in the introduction of electric vehicles will be:

To bring home to the horse vehicle user the very high cost which he pays for animal transportation (independent of the prevailing prices at which horses, feed and other material required may be purchased. In other words horse transportation costs very much more for the performance of any particular work than the owner of horse equipment usually appreciates.)

To analyze the performance of the work at present performed by horse vehicles so thoroughly that suitable machines might be consistently recommended in any particular case.

To bring out for consideration all the advantages which machine operation carries with it in regard to precision, regularity and reliability.

In presenting the subject to avoid as much as possible diverting the prospective machine user's attention from the real issues to the relatively unimportant details of mechanical equipment.

To deal with him in terms which will enable him to arrive at a true economic value of machine installation, either as to serviceability or as a time or labor saver.

To avoid undertakings of a doubtful or experimental nature with regard to the machines' ability.

To induce the prospective user to regard the project in the same manner as he would the installation of a power plant for other purposes.

To render such assistance during the preliminary period of use as will prevent the mis-application or abuse of machines.

In the execution of such a program there is no doubt that the united exertion of the interested parties can bring about such uniformity of action as will class this business on a par with other older lines of commercial engineering.

INCENTIVES TO FAVORABLE CONSIDERATION.

One of the greatest incentives to the favorable consideration of electric vehicle employment will be to direct attention to the present stability of electric vehicle equipment as compared with any other type of motor vehicle. The electric machine has been evolved under the most rigorous and exacting service during the past 15 years and as a successful device in quantity installation for commercial purposes, has commanded the endorsement and investment of the merchant community to a greater extent than any other kind of motor vehicle.

Large installations of such vehicles in all the principal cities of the country and their economical performances, have instilled such confidence among those conversant with their capabilities as to put them in the class with all other staple industrial apparatus. Some of the underlying considerations which have developed this confidence are as follows:

The principles of their design are founded on those developed in the street railway industry, the critical component parts of their equipment being made in the same large electrical apparatus manufacturing establishments.

Their reliability and simplicity are on a par with that of the street car, and they have many superior features contributing to a wider range of usefulness, without the necessity of any higher grade of operator than that which prevails in street railway service.

They are made up of the least number of moving parts of any type of motor vehicle, so designed and applied as to be practically fool-proof.

Their performance is so predetermined that the operator has little to do but to apply power and steer the machine.

The working equipment has been so standardized that the renewable wearing parts are readily replaceable at low cost, and are available in all the principal centers of the country.

Wherever they have been installed within the field of rational application they have not only remained, but by the influence of their economy have forced an increase in their number.

Many million dollars have been invested in the electric commercial vehicle by the most conservative business organizations in the country, including express companies and others to whom the reliability of transportation equipment is of vital importance, and no corresponding collective investments have been made in any other type of commercial motor vehicle.

The following will illustrate the value of the investments made to date in a comparatively few lines of business:

Department Stores	$5,627,000
Brewers	5,350,000
Public Service Companies	3,671,000
Express and Transfer Companies	3,010,000
Wholesale Merchants and Manufacturers	2,088,000
Packing House Organizations	609,000
United States Government Service	435,000

CARE AND MAINTENANCE.

After an evolutionary period of twenty years devoted to the manufacture of electric vehicles, and the many thousands of them in successful use in every possible service, it seems incredible that there should exist the least doubt of their economy, simplicity and efficiency. Yet we constantly hear the evidence of skepticism from those who have a very superficial knowledge of the inherent possibilities of the machines, or from those who have used them without that simple, practical knowledge essential to their successful operation.

There is abundant proof that wherever a properly designed electric automobile, with an adequately powered battery, has been put to the service for which it was intended, it fulfilled to the limit every requirement expected. Of course it has had to be treated with that qualified attention which might reasonably be accorded to any mechanical contrivance. If this is done, no beast of burden ever serves its operator more faithfully or responds more readily to fair treatment.

It is a delusion to assume that anything in the nature of a scientific education is necessary to the proper care of an electric vehicle. But it does call for a reasonable amount of every-day common sense, and a little special information as to what to do and when to do it, and the faculty for doing that "it" just as often as required. With this equipment any healthy male or female can compete with a college professor.

The problem of properly caring for an electric automobile involves a practical acquaintance with the detail parts and how to keep them in working condition. This knowledge can readily be acquired.

EQUIPMENT IN GENERAL.

To acquire a general knowledge of the vehicle begin by resolving the whole machine into its various elements, studying the part which each plays in the harmony of the whole. Observe the mechanical details and the special features of construction. Note the peculiarity of the steering device and its difference from that of a horse-drawn vehicle. Think out the reason for this construction. Examine the nature of the wheel bearings and the bearings of the other moving parts. See what provision there is for adjustment when wear takes place. Look at the various connecting rods and the kind of ends they have, how their length is altered and for what purpose, the provisions, if any, for taking up wear and the method of lubrication.

There is nothing extraordinary about the care to be given to these parts. They should be watched and oiled, with the fact ever in mind that they are vital to the whole mechanism, and that while this part of the machine is subjected to the most violent usage it is often the most neglected. This is how errors creep in. The simple parts are overlooked. Friction or looseness in any of these parts means increased cost of operation and depreciation of the machine.

Now look at the method of transmitting the power to the wheels, the various details of this transmission, the speed reduction; if you are sufficiently interested, the method of adjustment in case of wear, the provision for lubrication, and the plan for removal in case of necessity. Next study the brakes, their design and method of action, all the small parts about them which require oiling to insure prompt and perfect action. This is worth being sure of, as the importance of the brake is vital and its use frequent and severe.

The motor can next be considered. To the uninitiated it constitutes the first formidable feature, although practically there is nothing formidable about it. It is simplicity itself, and consists of two magnets, one stationary and the other revolving in the center of it The wire is wound around these magnets in a peculiar way, but it is unnecessary to consider the principles which relate to the design and theory, in which we are not interested at present. (The details of motor construction and operating principles are similar to motors used for industrial purposes and are described elsewhere.)

The current which operates the motor comes from the battery, and as it must of necessity enter the wire on the moving magnet or armature, the cylindrical copper device, or commutator, at one end of it, serves for this purpose. To the ends of the wire leading from the battery are attached pieces of carbon, called brushes, which rest upon the revolving commutator and thus convey the current to the moving wire-wound armature. It is important that proper contact is insured between the brushes and the commutator at all times, and as these brushes will wear down they will require occasional renewal.

The bearings on the motor will call for the same attention as the other bearings of the machine. The wire terminals and other details of the motor should be kept tight and dry, and separate. Like all other electrical apparatus with which we are familiar in daily life, the motor really requires very little attention, but being located under a wagon and exposed to all kinds of severity, it is but reasonable to give it a trifle more attention and consideration than the fan in your office.

The wiring about the machine is not usually exposed, but wherever it is, all that is necessary is to keep it dry and clean and where possible, particularly in the vicinity of the battery, keep each wire separate from the others.

The controller at first may seem a very complicated device, but a little familiarity with it simplifies it marvelously. It is nothing more than a switching arrangement for connecting the battery to the motor in various ways, so that the speed or direction of the motor may be changed. All wires from the battery and the motor are led to it and are each connected to brass strips or fingers resting on a rotating drum. This rotating drum has a number of inter-connected contacts, on which the fingers rest and by means of which they are connected with one another in various combinations. It is essential that the pressure between the fingers and these contacts be sufficient to insure good connection on the surface. The controller does not often get out of order unless abused or entirely neglected, but the damage done under such circumstances may be disastrous to the whole apparatus.

It is interesting to study out the wiring connections. The manufacturer is usually willing to furnish a diagram for any particular vehicle. The benefit of such information is felt when locating electrical troubles, as the controller, being the center of distribution, is the keyboard to the whole electrical equipment.

The lighting and signaling devices are perhaps regarded as most insignificant when not in use, but in emergency they are of much consequence. Do not neglect them.

The charging receptacle must be kept clean and in such condition that when the plug from the charging apparatus is inserted in it the connection established will form good contact. Maintain the receptacle securely fastened to the vehicle so that there is nothing loose or rickety about it. Be sure it is protected from being wet either by rain or in washing. When not in use for charging a suitable cover protects it against accidental connection between its terminals. Trouble of this nature might cause the loss of the battery or the burning of the machine, as the whole power of the battery is on tap at this receptacle except when disconnected by means of the main switch.

Now about the meter or meters with which nearly all vehicles are equipped. They are the visible indicators of the inside workings of the electrical equipment. It is important that they should be "right" in the same sense as that term is applied to a watch. But it is unnecessary to be conversant with the theory of volts and amperes. Just remember that one signifies the quality and the other the quantity of the power going in or out of the battery.

Of course you may be familiar with all of the foregoing, and may smile at its ridiculous simplicity, but the purpose

of this description is to endeavor to dispel some little of the haze which is prevalent on the subject of the reasonable care necessary for the electric automobile.

BATTERY MAINTENANCE SIMPLE.

A practical knowledge of the proper treatment of a storage battery is essential to its successful operation. To obtain this knowledge is not nearly so difficult as is generally supposed. Anyone who will seriously make up his mind to master it will find the problem comparatively simple. A few years ago there was much diversity of opinion as to the proper treatment of vehicle storage batteries. The pressure which business necessity brought to bear on the development of successful practical methods has brushed aside many of the fancy theories previously in existence and established hard and fast common sense practices, which, if adhered to, are certain to product positive results.

The storage battery as seen through our text books appears decidedly complicated, but when resolved into the component parts of each cell there is nothing more mysterious about it than some lead plates immersed in a solution of acid and water.

In order to examine the elements of which the battery is composed it is necessary to be able to get at them with ease. The construction of the vehicle has much to do with the means necessary to accomplish this. If possible the battery should be withdrawn from the vehicle and placed on supports in such a manner that you can walk all around it, and reach without difficulty any particular cell. The battery is no more complex than a single cell. In the lead type of battery it consists of a hard rubber jar containing two groups of lead plates immersed in water and a small proportion of sulphuric acid. These two groups of plates are practically alike. They are made of lead. But the chemical nature of the active material on the plates is somewhat different. By the act of charging, or putting current into the cell, the nature of the active material is changed, and by the action of discharging the cell, or withdrawing the current from it, the active material is converted back into its original state. In the nickel-iron type of battery, the principles are the same, but the materials different. The jar is of steel, the plates contain active material of nickel hydrate and iron oxide, the liquid electroylyte is water with some potash added, constituting an alkaline solution.

THE HORSE AND THE BATTERY.

There is a somewhat peculiar resemblance, ludicrous as it may seem, between a horse and a storage battery. If one who has been familiar with the care and management of the former will study its comparison to the latter, he may more readily become familiar with that method of handling the battery which will tend to make it most serviceable. The process which goes on in the charge and discharge of a battery is no more difficult to comprehend than the action which goes on every day in resting and working a horse. A certain amount of energy is put into his system by feed and sleep. If the quantity of each is sufficient the process which goes on is invigorating and refreshing and when called upon to work, after this sleeping or charging period, he is full of life and energy. His potential or voltage is keyed up to the top notch and he is ready and willing to perform any reasonable service called for. If forced during the first few hours of labor, fatigue will set in prematurely and his working efficiency, or the possible labor which he might render, is very low. If, on the other hand, the work is so proportioned that an honest and reasonable day's labor is performed, the period of fatigue will not set in until the day's service is completed, and the period of rest and recuperation may follow in natural sequence as before. This procedure is identical with a battery.

The storage battery is an inanimate horse in many other ways. The grid in one may be compared to the frame or skeleton in the other. Not much trouble will occur from either, except in the accident of fracture. The active material of the battery plate, which is compressed into the frame, is similar to the flesh of the horse's frame, and each should be plentiful, firm and healthy to get the best results. Defects in one case will very closely resemble defects in the other. The theory of the process which goes on in the refreshment and fatigue of horseflesh is as difficult for the layman to understand as the nature of the chemical change in the active material on a battery plate; but there is in reality no more reason to be concerned about the one than about the other. All that is necessary is to know and perform that method of treatment which in every day hard service will produce the results desired.

It will be evident, therefore, that the care of a storage battery does not call for any more intelligence than that required for horseflesh, but the same ever vigilant attention, together with an equal amount of practical knowledge, is necessary to assure the continual working efficiency of a battery equipment. The one difference is that the results obtained in the latter will be far more definite, reliable and encouraging.

Just as a large stable of horses can be supervised by one intelligent, practical manager, so also can a large electric vehicle equipment be handled by a single competent workman. But he must be a competent workman in all the meaning of the term, and have enough of the qualifications of a manager to insist on the co-operation of his subordinates who actually operate the vehicles on the street.

As has been stated a battery, or in fact a whole equipment of batteries, is no more complicated than a single cell; and, therefore, it will be apparent that if we master the peculiarities of one cell we have control of the entire situation. The care of every single cell, however, is of vital importance as each one forms a link in the entire chain.

STORAGE BATTERIES.

The storage battery is made of two groups of plates, positive and negative. The plates of each group are joined to a common strap to which a terminal is attached called the positive and negative terminals of the battery respectively. The groups are dovetailed into each other and between the plates, separators are placed to prevent the plates from touching. The groups are contained in a jar or can and are completely covered with a solution called electrolyte.

For the electric vehicles two types are used, the lead and nickel-iron.

Lead Batteries:—There are two varieties of lead batteries, the flat and the pencil plate. In the flat plate variety the positive plates are made of antimonious lead grids which support the working material, peroxide of lead. The pencil positive (ironclad) is made up of pencil shaped vertical rubber tubes with horizontal slots of proper dimensions to allow sufficient electrolyte to penetrate to the working material, peroxide of lead, which is packed in the tubes. In the center of the tubes are rods of antimonious lead the ends of which are burned to the upper and lower frame of the plate, and through these lead rods the current is conducted to and from the working material.

The negative plates used with both varieties of positive plates are made of the same kind of grid as the flat positive but the working material is pure spongy lead.

The separators for the flat plate are grooved wood and perforated hard rubber sheets. The perforated hard rubber separators are placed next to the positive plate to prevent the working material from falling to the bottom of the jar and also to protect the wood separator. The wood separators are grooved so that a greater quantity of electrolyte may be obtained between the plates and at the same time fit snugly between the plates to prevent their moving. For the pencil positive a plain wood separator without grooves is used and the rubber separator omitted.

The electrolyte for the two varieties of lead batteries is a dilute solution of sulphuric acid of 1.280 specific gravity and only that approved by battery manufacturers should be used.

The containing jars are made of hard rubber, the quality of which should be the best that can be obtained, as the cheap jars are in the end more expensive, due to the greater number that break on account of their brittleness.

The cells of the battery are arranged in trays according to the design of the vehicle. Where hydraulic lifts are used for removing the battery, it is assembled in one tray, but where the battery is moved by hand it is arranged in several sections to make handling less difficult.

Operation:—In the working of the lead battery, energy taken from it by discharging is the result of the electrolyte combining with the peroxide of the positive plate and the spongy lead of the negative plate, partially sulphating the working material of both plates and at the same time weakening the electrolyte. In a normal rate discharge (five-hour rate) the voltage of a cell starts about 2.07 volts and finishes at 1.70 volts, and the specific gravity of the electrolyte drops from 1.280 to 1.180. On the recharge the plates are brought back to their original condition of peroxide of lead on the positive and spongy lead on the negative, and the electrolyte rises in specific gravity to its original strength, 1.280. The voltage at the beginning of charge is about 2.15 and at the finish about 2.55 when the normal rate of charge is used.

Care of Batteries:—The instruction books furnished by the manufacturers should always be studied by the users of batteries until they are well acquainted with all of the essential

details of operation and care. Where indifferent results have been obtained in the operation and life of batteries, the cause can readily be traced to the lack of attention necessary for proper upkeep.

A properly constructed battery should not require a great amount of care if the important features of operation and maintenance are at all times strictly adhered to. These important features are, that in discharging or using the battery in the vehicle, the amount of discharge should be limited to what will give a fair speed of the vehicle or, in other words, when the speed is noticeably slower, go to the charging plug and boost rather than have the vehicle towed in; or if there is a doubt of the battery having sufficient capacity to do the day's work, boost at the noon hour, thereby increasing both the speed of the vehicle and the electrical efficiency of the battery.

In charging or boosting, the rate of current should be kept low enough to prevent excessive gassing and heating. The regular charge should be started and continued at as low a rate as time will permit until a fully charged condition is reached. By this manner of charging the cells that are slower in coming to a full charge can be fully charged without injury to those cells which have charged up quicker.

If the above manner of charging is practiced less evaporation of water will occur in the battery and consequently watering or flushing will be required less frequently. The tops of the plates should never become uncovered, otherwise the capacity is reduced in proportion to the amount of plate surface exposed above the electrolyte, and also the negative plates tend to oxidize, and as a result they will require extra charging to bring them back to normal condition.

Overcharging at intervals of about two weeks should be done to prevent the negative plates from falling behind the positive plates as to their fully charged state and to bring up to a fully charged condition any cells that lag behind.

Individual cell readings of voltage and specific gravity should be taken once a month to find cells that require attention and to determine the condition of the battery in general.

Watch should be kept upon the amount of sediment in the bottom of the jars and they should be cleaned before the sediment reaches the bottom of the plates. If this precaution is not taken a greater amount of energy will be required to charge and the life of the plates will be shortened.

Nickel-Iron Battery:—The working material of the nickel-iron battery is contained in metallic tubes and pockets, each plate being composed of a number of filled tubes or pockets, securely mounted in a supporting and conducting frame or grid, in good contact therewith to provide conductivity for the current.

The working material of the positive plate is a form of nickel hydrate, and of the negative plate is iron oxide.

The cans or containers are of sheet steel, nickel plated, having welded seams, and with corrugated sides for stiffening.

The cover of the can is provided with a capped opening for renewing the electrolyte and adding water; a valve opening called separator for separating the gas from the spray; and two openings, fitted with stuffing boxes, through which the terminal posts project.

For separating and insulating the plates from each other and from the cans, hard rubber is used.

The electrolyte is a 21 per cent. solution of potassium hydrate with a small percentage of lithium hydrate.

The trays are of light skeleton construction and the number of cells in each tray depends upon the size of cells and the design of the battery compartment.

Operation:—The action which takes place in a nickel-iron cell, both in charging and discharging, is a transfer of oxygen from one group of plates to the other, hence this type of cell is sometimes called an oxygen lift cell. In a charged cell the working material of the positive plates is superoxidized, and that of the negative plates is in a spongy or deoxidized state.

In discharging, the positive plates deoxidize and the oxygen, with its natural affinity for iron, goes to the negative plates, oxidizing them.

The electrolyte does not enter into chemical combination to perform the functions of the cells, but acts merely as a conveyer; it therefore does not change in specific gravity during charge and discharge other than through evaporation and changes in temperature.

The voltage of a cell on discharge at the normal rate (5-hour rate) starts at about 1.45 and finishes at 1 volt, the average being 1.2 volts. On the recharge the voltage starts at about 1.54 and finishes at about 1.8 volts.

Care of Batteries:—As in lead batteries the instructions of the manufacturer should be scrupulously followed to produce the best results. The principal features to be observed in the care of this type of battery are that the temperature be kept below 115° F. during dischrage and 100° F. during charge.

That the cells be kept clean so that no corrosion of cans can take place due to electrolysis;

That the gas valves be kept in working order;

That the cells be always properly filled with water and the plates never allowed to become uncovered;

That no solution be put in the cells except that provided by the manufacturer and that the water used for replacing evaporation be approved.

Precautions:—Use direct current only for charging and always connect the positive pole of the battery to the positive supply bus.

Do not take voltmeter readings except when the battery is charging or discharging, as they do not have much significance.

Do not allow a temperature above 100° F. when charging if it can be prevented by lowering the charging rate or by better ventilation of the battery compartment.

Never use acid for replacing evaporation or to bring up the specific gravity to normal in the lead battery unless it has had a thorough charge and the specific gravity will not rise by further charging.

When not in use keep the lead battery fully charged.

Keep the tops of the cells and all connections clean.

Use water approved by the battery manufacturer for filling and put it in the cells, not on top of them.

Do not bring a naked flame near a battery when charging or at any time there is gas being evolved as there is danger of an explosion.

(*To Be Continued in the January Issue.*)

Flanders Represented in Chicago

Chicago, the home of the electric motor car, has added another to her already long list of agencies. The Flanders is the latest of the electric cars to come into the Chicago field with the opening of new salesrooms at 918 South Michigan avenue. Although the Flanders formerly was handled in Chicago it has been out of the Chicago field for two years and is virtually a new machine to the majority of Chicagoans.

Officials of the Flanders claim for it the distinction of being the lowest priced electric car on the market, although they naturally balk strongly at any suggestion of "cheapness." Although the retail price of the Flanders is said to be $1,000 lower than that of any other electric car on the market, according to local officials, the cost price to the factory is within $300 of that of any other car.

Morris Rothschild, a Chicago man, is the chief figure in the corporation which has its offices and factories in Pontiac, Mich. The president of the local agency is James R. Dean and the other officers the George B. Young, Jr., vice president; Carl Hines, treasurer, and E. R. Rockwell, secretary. Housed in the same building with the salesrooms is the service station which is to be maintained by the Chicago agency.

Cleveland to Have Motor-Bus Lines

The Cleveland, O., Railways Company, which operates the trolley lines in that city and suburbs, has been given authority by the city council to operate motor-buses in different sections that are not now served by the regular electric car lines. The company purposes to begin experimentally, and if the patronage is sufficient to justify, it will increase the number of machines.

ELECTRIC VEHICLES

PUBLISHED MONTHLY BY

ELECTRICITY MAGAZINE CORPORATION

Monadnock Building, Chicago

TELEPHONES: HARRISON 3014—AUTOMATIC 61028

New York Office, 1022 Longacre Building, 42nd Street and Broadway.

Ed. J. Mock and Paul H. Woodruff, Editors

FRED B. SCHAFER, Associate Editor.
ALLEN L. HAASE, Advertising Manager

Entered as second-class matter January 22, 1912, at the postoffice at Chicago, Illinois, under act of March 3, 1879.

TERMS OF SUBSCRIPTION

United States, Cuba and Mexico	Per year,	$1.50
Canada	Per year,	1.75
Foreign countries within the Postal Union	Per year,	2.00
Single copy		.15

NOTICE TO ADVERTISERS

Changes of advertising copy should reach the office of publication not less than ten days in advance of date of issue. Regular date of issue, the first day of each month. New advertisements will he accepted up to witbin five days of date of issue, hut proof of such advertisements can not be shown in advance of publication.

NOTICE TO SUBSCRIBERS

REMITTANCES—Remittances should be made by cbeck, New York draft or money order, in favor of ELECTRIC VEHICLES. Foreign subscriptions may be remitted direct by International Postal Money Order.

CHANGE OF ADDRESS—The old address should he given as well as the new, and notice should be received two weeks in advance of the desired change.

This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in ELECTRIC VEHICLES *or any voice in its management or policy.*

CHICAGO, DECEMBER, 1914

TABLE OF CONTENTS.

A MAN'S CAR.

SINCE the beginning of civilization, the thought of luxury has been associated with the fair sex. Since the electric spelled luxury in its appearance, ease of operation and lack of noise and dirt, it was quickly appropriated by the American woman. In fact the close relationship between the electric and the woman early became so evident that a great many manufacturers devoted pages of advertising to "My Lady." Needless to say, this incessant din of specialized publicity to one class had its effects—both good and bad. In the first place many women were influenced by this appeal to the extent of a purchase. Every new woman purchaser assisted in giving the general public the idea that the electric was a woman's car, entirely too effeminate for men. The average man wishes to be regarded as a man clear through. The electric, resplendant in its luxury, stands forth as a beautiful thing—for women. This conception has taken many years to drive into the minds of the public. And all these years have been spent in increasing the gulf between this splendid vehicle and man, the purchasing power. The electric will never reach its maximum in sales until it is made and advertised to appeal not only to the women but to men, the hundred thousand men who could readily be interested in a car built for economy, reliability and ease of operation, usable all the year round in all weathers.

BAD ACCOUNTS.

WE ARE led to believe that if we were to investigate the books of the average electric garage we would find a great many unpaid accounts as old as six months. To the garage man, unpaid accounts are a problem. Outstanding money is a dead investment, nine-tenths of which represents actual investment devoted to retaining service. From a legal standpoint the garageman has but one recourse—diplomatic collection. And collection often passes the bounds of courtesy and diplomacy when a woman owner exhausts her running expense appropriation for other purposes than the just payment of her garage bills. One of the largest electric garage owners in the country recently stated that two-thirds of his garage accounts were in the "C" class; not uncollectible but necessitating constant dunning in order to secure payment. In some cases garagemen are obliged to lose the account and all the back payments due. This is indeed unfair, especially to those faithful promoters who are attempting to establish an industry so vitally important to the success of this type of vehicle.

In spite of these conditions, there are methods whereby electric garagemen can protect themselves or at least make refusal of payment unpleasant. On opening a new account a binding contract might be used in conveying a lien or even a mortgage on the vehicle where accounts are unpaid. Another and probably more effective yet diplomatic method suggests itself in the closer communication through the E.V.A. and Garage Men's Association. Bad accounts could be listed each month from reports received by complaining members. These lists would give welcome information to garagemen who were about to grant service to those delinquents who had been refused further accommodation by their former garage. Such association listing, entirely justified in all cases, would at once establish the knowledge of customers' credits so necessary to the few enthusiasts who are attempting to maintain in a commercially efficient condition this important branch of the industry.

HIKER SERVICE.

THOSE garages which employ the so called "hiker" to call for and deliver cars to their owners are an important cog in garage service.

Too often the hiker, as a rule a careless boy, drives to and from his destination at excessive speed, applies the brakes too suddenly and very often runs into the curb when turning corners. All these seemingly slight abuses lead to quick deterioration of the vehicle in its batteries, tires, wheel alignment and general appearance and operation.

Not only on the street but likewise within the garage, where congestion always exists, the hiker often finds it necessary to back into very narrow openings. It is at these times that careless driving leaves its reminiscences on scratched and bent fenders and wheel caps and an occasional injured battery hood.

The average garage, in order to live up to its time schedule guarantee, insists on constant speed in order to cope with the desires of its entire clientele. Because of this demand for speed the hiker forms the habit of getting there or back as fast as possible; and more probably because of instructions than personal negligence.

In many garages during the dull hours the hiker devotes much of his time to keeping the cars dusted. Greasy hands leave finger marks which reflect on the service of the garage. The average electric is driven by a woman and this type of carelessness is seldom overlooked.

The element of cleanliness likewise enters into the personal appearance of the hiker. The neat appearing driver radiates the thoroughness of the service which extends to the car itself. The owner appreciates the management that encourages absolute cleanliness, careful driving on deliveries and proper operation of the car enroute.

SELLING PROMISES.

COMPETITION in selling electrics seems to offer encouragement to pass the bounds of courtesy and honorable business practice. Some electric vehicle dealers will stop at no method in closing a purchase. Prospective purchasers are obliged to listen to selling argument based on entirely impossible claims. Speed, mileage, life of the batteries and tires, accurate costs of charging and garaging are exaggerated to such an extent that the prospect purchases in deception. What is the result? The car will not live up to its owner's expectations. A complaint to the manufacturer follows. The car is inspected and the "buck passed" to the garageman who is blamed for improper charging. The garage is changed and a similar trouble occurs due to poor mileage. By this time the manufacturer can blame it on to depreciation of the battery. The owner is dissatisfied, he loses confidence in his vehicle and sooner or later explains to his neighbor that the electric is a joke. There is a remedy and one which will not lessen the selling value in the long run. Every manufacturer knows what his latest model will perform. Let him see that his car is sold on its merits stated truthfully. If his car will not perform as well as another type, let him correct the defect. Permanent success is not obtained by selling on the old theory of *caveat emptor*. The satisfied purchaser is the strongest selling power existing and an owner who is dissatisfied purely because his car will not live up to the dealer's promises would in the majority of cases be well pleased with his investment if he had purchased with the knowledge of just what his car would do.

COVERING THE ENTIRE FIELD.

A CERTAIN electric vehicle manufacturer advertises "In the ownership and operation of an electric, the recollection of quality remains long after the price is forgotten." Truthful as this statement may be there surely should be a grade of product for that buyer who pays $3.50 for his shoes instead of $8.00 as his wealthier neighbor does. Electric vehicle manufacturers seem to believe that the question of price is an element rarely considered, yet if we study any other industry we will always find a grade of product for each class. For instance all piano manufacturers make a high priced instrument and also one of medium price and inferior quality, good enough to satisfy a certain demand, which really constitutes the large field. Thus it is in any industry from the grocery man with his various grades of eatables to the gasoline automobile manufacturer with both low and high priced vehicles. But the electric vehicle is a standard priced car and if the buyer cannot afford the best he has no alternative but to get a gas car. The electric vehicle manufacturer says "give us quantity production." If all the electric cars made last year were built in the same shop there would not be a quantity production great enough materially to reduce the price if reduction was based purely on manufacturing savings.

TOURING VS. SALES POLICY.

OPINIONS differ as to the real field of the electric passenger car. Some manufacturers encourage tours in order to eliminate the idea that the electric is purely a car for local runs in the city. Other manufacturers contest this sales policy and insist on establishing the car purely as a city vehicle. This latter attitude has no doubt come from unpleasant experience with boasted mileages that resulted in disappointment to the owner. It is poor policy to encourage false expectations and without a doubt the question of touring should be avoided as much as possible in sales arguments. It should be left wholly with the owner whether or not touring can be accomplished successfully. It takes but a short time for an owner to learn the proper manipulation of his vehicle and its exact mileage per charge. The variance in types, models, highways, and the operation of different drivers, makes it impossible to establish a general mileage radius which will hold true for all vehicles.

An owner is much better satisfied if he finds that the vehicle is capable of performing beyond his expectations, instead of falling short of them.

THE "ROAD HOG."

MANY drivers, accustomed to operate motor vehicles in the cities are often compelled to run close and get used to a narrow margin. Consequently, when they drive into the country upon even the widest roads they continue the practice of running close, much to the annoyance of those who are made nervous by the big machines rushing by within a few inches.

While this taking a chance may seem safe to the city man, nevertheless it is likely to bring him disaster through the fright of the other fellow. There is constant complaint that some of the motor drivers are "road hogs," and, while it may be true, they should realize that it is taking desperate chances to rush within a few inches of a green hand at the wheel.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees, and New Announcements

BY A. JACKSON MARSHALL

THE following is an abstract of the secretary's report, presented before the meeting of the council, held in the general office of the association at New York City, November 16.

Those in attendance were as follows: Messrs. John F. Gilchrist, president; H. M. Edwards, treasurer; Frank W. Smith, P. D. Wagoner, E. P. Chalfant, W. P. Kennedy, E. S. Mansfield, R. L. Lloyd, A. Jackson Marshall, secretary.

The minutes of the last meeting were approved as presented.

MEMBERSHIP COMMITTEE, J. F. BECKER, CHAIRMAN.

Eight new members were elected to membership. The following is the classification of the membership to date:

MEMBERSHIP REPORT.

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	102	32	760	12	30	936
Applications	0	1	7	0	0	8
Pending	102	33	767	12	30	944
Total members		135	767	12	30	944

NEW ENGLAND SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	30	2	77	1	1	113
Transfer	0	0	1	0	0	1
Total members		32	76	1	1	112

CHICAGO SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	7	5	103	1	6	122
Transfer	0	0	1	0	0	1
Total	7	5	104	1	6	123
Applications	0	0	1	0	0	1
Pending	7	5	105	1	6	124
Total members		12	105	1	6	124

PHILADELPHIA SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	1	3	66	1	1	72
Total members		4	66	1	1	72

WASHINGTON SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	1	0	42	0	0	43
Total members	1	0	42	0	0	43

CINCINNATI SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	1	0	12	0	0	13
Total members	1	0	12	0	0	13

SAN FRANCISCO SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	0	0	17	0	1	18
Total members	0	0	17	0	1	18

LOS ANGELES SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	4	0	46	0	0	50
Applications	0	0	5	0	0	5
Pending	4	0	51	0	0	55
Total members		4	51	0	0	55

PITTSBURGH SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	1	1	27	0	1	30
Total members		2	27	0	1	30

NEW YORK SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	9	8	186	3	18	224
Transfer	0	0	1	0	0	1
Total	9	8	185	3	18	223
Applications	0	0	1	0	0	1
Pending	9	8	186	3	18	224
Total members		17	186	3	18	224

DETROIT SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	2	3	38	0	0	43
Total members		5	38	0	0	43

CLEVELAND SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	0	3	14	1	0	18
Total members		3	14	1	0	18

TORONTO SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	2	1	13	0	1	17
Total members		3	13	0	1	17

DENVER SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	1	0	17	0	0	18
Total members		1	17	0	0	18

ST. LOUIS SECTION

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	1	1	16	0	0	18
Transfers	0	0	1	0	0	1
Total	1	1	17	0	0	19
Total members		2	17	0	0	19

MEMBERS AT LARGE

	Active C. S.	Active Mfrs.	Associate	Auxiliary	Press	Total
October report	37	5	74	5	1	122
Applications	0	1	0	0	0	1
Pending	37	6	74	5	1	123
Total members		43	74	5	1	123

It is interesting to note that the membership a year ago was 437; membership at this date is 944, a gain of 507, being an increase of over 100 per cent in one year.

In each of the fourteen sections, all related interests are well organized and intensive development campaigns are under way, all of which, in connection with the activities of the association at large, is lending a tremendous impetus to the promotion of the electric vehicle.

Philadelphia Convention:—The reports received from a number of sources since the recently held fifth annual convention have been of the most encouraging nature. The convention, being successful beyond the most sanguine hopes or predictions, was attended by nearly 500 delegates, or over one-half the total membership of the association, a phenomenal demonstration of the growing importance of the electric vehicle and all the more noteworthy because this unprecedented attendance was had in the face of depression and at a time when other societies and associations were experiencing large decreases in convention attendance.

A few facts in connection with convention papers may not be amiss. There were printed 48 convention papers and reports, contained in 27 separate booklets, spread over about 525 pages, carrying 129 half and full-page cuts, six very large cuts on inserts, and one especially drawn three-colored map, indicating charging facilities along the Lincoln Highway and tributary roads, and it is also noteworthy that these papers and reports were all available in advance of the convention. It seems to be the concensus of opinion that the fifth annual convention represents an epoch in the industry, and will prove of tremendous assistance in stimulating and accelerating development.

SECTIONS.

New York Section:—An unusually interesting meeting of the New York section was held Tuesday, November 17, in the Consolidated Gas Company's auditorium, New York City, with D. C. Fenner, vice-chairman, presiding in the absence of Chairman Harvey Robinson, who, fortunately, is rapidly recovering from a recent attack of illness.

The speaker of the evening was R. McAllister Lloyd, consulting engineer of New York City, who took for his subject "The Influence of the Pioneer Spirit on Electric Vehicle Progress." Mr. Lloyd's reminiscences were intensely interesting, as they dwelt, in some instances, with personalities and details, which are generally not known. This paper appears elsewhere in this issue.

The discussion was participated in by Messrs. George H. Duck, A. Jackson Marshall, secretary of the association; F. F. Phillips, F. Nelson Carle, F. F. Sampson, W. W. White, W. C. Andrews, Henry G. McComb, T. A. Aspell, and David F. Tobias, secretary of the New York section.

Chicago Section had a meeting on November 3 at the Railroad Club. The meeting was called to order by F. E. McDowell, chairman, who announced a new committee to be known as "The Attendance Committee" and composed of members as follows: F. E. McCall, T. A. Cressey, E. B. Forslund, H. B. Phillips, Fred Schafer.

The duty of this committee is to promote the attendance and the chairman hinted that systematically calling up the members on meeting day would probably bring best results.

The chairman then spoke of the further future of the electric in Chicago and asked for suggestions which, if followed up, would prove the greatest immediate factor in its success.

Ralph Temple offered some valuable suggestions in a general way, and said he would have given more had he had more time for preparation.

The chairman called on Mr. Whipple, of the Anderson Electric Car Company. He responded by saying that the meetings should be livened up; something should be done that would provoke discussion, so that all would feel like taking part. Also elucidated on the present combined advertising campaign in which his company is participating, stating that their intention was to advertise the utility of the electric car instead of burdening the public with special features.

At the chairman's solicitation, E. P. Chalfant gave a short discourse on the greatest immediate need for the electric. Said the European (pay-for-what-you-get) garage plan will be one of the greatest helps. Further gave a very interesting and instructive description of the effect of the present war upon Wall street.

Mr. Temple asked for a vote of thanks for Mr. Chalfant for the interesting account of Wall street conditions. This was unanimously placed, and the meeting adjourned.

Another section meeting was held on November 10, at the Railroad Club.

At the chairman's suggestion, the secretary read a letter from William D. Ray, of the Northern Indiana Gas & Electric Company, which was an answer to the statements made by Mr. Salvat at the October 27 meeting concerning the conditions found at Hammond, Ind.

The chairman read the report of the parcel post committee. This developed some very good discussion. Plans were immediately started for a campaign to secure some of the future hauling for the Chicago post office. As some of the contracts are to expire the middle of next year, and as the contracts are generally let some time in advance, it was the opinion of all present that the time had come for E. V. A. members to get busy. The majority of opinion went to the effect that most good could be done as representatives of the E. V. A. rather than as individual interests. The chairman said he would confer with President John F. Gilchrist as to the best plan for action.

Los Angeles Section:—The Los Angeles section held a section meeting on November 4 in the Jonathan Club.

The chairman of the membership committee filed four applications for associate membership.

The executive committee voted favorably on these applications.

Harry W. Harrison, of the Commercial Electric Garage, read a most interesting, comprehensive paper on "Electric Vehicles on the Pacific Coast."

Mr. Ingalls, delivery manager of H. Jevne Co., the largest wholesale and retail grocer's firm in Southern California, told of the successful operation of the electric in both their wholesale and retail delivery.

David H. Lane, of the Kendall Auto Company, Pasadena, read an editorial taken from "The Automobile" on the $500 electric, which brought forth considerable discussion.

C. H. Osborne spoke on the Electriquette, the

electrically propelled wheel chair that is to be installed in the exposition grounds of the Panama-California Exposition to be held in San Diego, Cal., 1915. Mr. Osborne has sold 100 of these chair cars and reported that there will doubtless be 500 of them in operation in the exposition grounds.

E. B. Moore, electrical engineer for Los Angeles Creamery Auto & Machine Company, made an interesting report on the operation of the three electric retail milk delivery wagons manufactured and operated by this company. These vehicles cover an average of 24 miles a day, making about 170 stops and 300 deliveries. They are performing most economically and have replaced seven teams. They are now having specifications drawn for another installation of 15, showing the faith this, the largest concern of this kind on the Pacific coast, has in the electric vehicle.

Mr. Hessie, general manager of the Motz Tire Company, gave an interesting talk on Motz tires, followed by A. T. Smith, of the Firestone Tire & Rubber Company, in rebuttal.

Mr. Waddell, of the *Los Angeles Times*, a daily and Sunday morning publication, and Mr. Wood, of the *Evening Herald,* were present and both promised to give publicity to the doings of the Los Angeles section of the Electric Vehicle Association of America, and of the electric vehicle industry in general. These two gentlemen are live prospects for press membership.

The treat of the evening was reserved for the last, an address by S. M. Kennedy, general agent of the Southern California Edison Company, who is the pioneer booster for electric vehicles on the Pacific coast. Mr. Kenndy talked from the shoulder and gave the dealers something to think of.

Denver Section:—E. M. Jackson, chairman of the Denver section, presided at an exceedingly interesting and well attended meeting, which was addressed by Oliver P. Fritchle, manufacturer of Fritchle automobiles and storage batteries, on the subject of the Fritchle mileostat, and by Nathaniel Fallek, of the Cook Railway Signal Company, manufacturers of Revivo batteries, on the subject of Revivo batteries.

Chairman Jackson announced the electric vehicle salon to be held the first week in January on sales floor of the Denver Gas & Electric Light Company. Invitations were extended by Mr. Jackson on behalf of the Denver Gas & Electric Light Company to all local vehicle representatives, storage battery representatives, charging outfit manufacturers' representatives, accessory representatives and garage owners to exhibit high class and up to date vehicles and equipment. Already a large number of acceptances have been received, which assure a highly successful exhibition, which it is calculated will go far to stimulating and creating interest in electric vehicles in and about Denver.

Woods Offers New Four Passenger Model

Recognizing the demand for a four-passenger electric car, the Woods Motor Vehicle Company is putting on the market a new model, known as No. 1522. This model has the same width of rear seat as the larger five-passenger Woods electrics. Being built on a chassis with 100-inch wheel base, as against 110-inch in the larger cars, this model has a slightly shorter body length. It has one revolving chair in the right front of the car, in place of two in the front as in the five-passenger models.

It is a very roomy car, seating its four passengers as comfortably, with as much room to spare, as the larger cars have with five passengers.

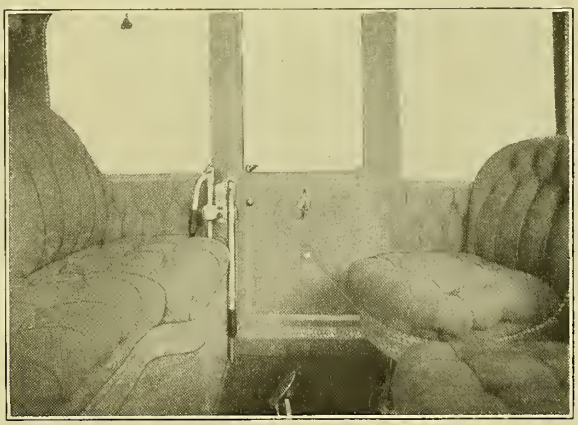
As usual, the Woods company puts great stress upon the mechanical features of their 1915 models.

Woods Light 4-Passenger Model.

The importance of extra resilient springs is again emphasized. There are full elliptic springs in front, as well as in the rear. The easy riding qualities of the car are further increased by the unique method of mounting the rear springs on radius rods, instead of on the rear axle. It is asserted this construction reduces by at least 30 per cent the road shock which these springs are required to absorb.

A decidedly unusual feature is the method of attaching the front and rear springs direct to the side members of the main chassis frame without the use of the customary spring clips or shackles. This is made possible by constructing the channel steel main chassis frames with the opening down. The springs set in the opening and are bolted solidly direct to the frames.

The batteries are supported by special sub-frames,



Interior Seating Arrangement.

low down, between the main chassis frame members. By carrying the battery weight comparatively close to the ground and thus lowering the center of gravity, the car is said to ride more steadily and to be remarkably easy to control.

The Deferred Payment Plan

*Advantages and Disadvantages of Buying Trucks on Time Payments**

BY FRANK M. GREGG

THE deferred payment plan when used in conjunction by the manufacturer and agent, is a powerful factor in the sale of automobile trucks, but when used by the agent alone, it is weak and of little value.

Experience has taught that to put a successful selling campaign through you must have a plan. A plan means that the manufacturer has an objective in view and knows how to attain his goal.

The deferred payment method of selling trucks can be made a plan only when the manufacturer and the agent are linked together. To operate with the agent alone is not a plan, but is dealing with an isolated unit of a system.

The whole value of the plan when operated by the manufacturer and the agent is the power of organized effort. Agents of automobile concerns we assume like agents of other manufacturing concerns, are always looking towards the factory for aid and suggestions. The most versatile salesman if left alone will in time drift into bad ways of selling. Agents from Maine to California depend upon "headquarters" for selling plans and advice. Dynamite sales methods are rarely self created. They usually come from the factory. Coming from headquarters the plans are accepted as authority. This authority carries great possibilities if the factory has a message to deliver. In other words the agent in the field is open minded, ready to be influenced and work as a unit with headquarters. Consequently it behooves the manufacturer to make the most of this confidence bestowed upon him by the agent.

The one great object of every manufacturer is to attain a volume of business. Volume is the keystone of every manufacturing enterprise. The man with a competitive article who does not appreciate and understand this great rule, will in the end lose out. Volume reduced to its simplest form means more goods sold, more profits made. This is a crude statement of a fact that can be reduced to a science. We believe that no one will dispute the statement that volume is a necessity to a manufacturer.

Deferred payments give this volume. In every community there is a certain percentage of business men who can and will pay cash for a truck. In this same community it is also safe to say that there are twice as many men who can afford to buy trucks on the partial payment plan. In other words the possibilities of sales increase 200 per cent. This means volume. We again repeat the fundamental factor of the plan is volume.

The rules of the game must be of a peculiar character. They must be conservative to the point of safety yet liberal enough to be workable. Any plan that leaves the making of the terms of partial payment sales exclusively to the agent is ill advised and immoral. We say immoral because it offers opportunities for fraud which should not be left open to tempt men. There is only one course for the manufacturer, the agent, and the discount company to pursue, and that is a conservative safe plan, which will protect all three against loss. Any discount company that leaves a wide open door for the operation of the plan encourages agents to take risks which they otherwise would not do.

With safety first in mind we wish to submit a few rules on deferred payment plans based upon actual experience:

First, the truck must be sold safely. In general we should say that this would mean, a manufacturer or a wholesale merchandiser who buys a truck costing $2,000.00, or upward should have a rating of $10,000.00 to $20,000.00, second grade. This may seem high. But an analysis of the earning capacity of such a firm will prove conclusively that it is low. A firm with such a rating is not the best of risks to begin with. Assuming that a firm of such a rating has an investment of $20,000.00, the average earnings of such a concern is about 15 per cent per annum or $3,000.00. On the face of it an investment of $2,000.00, or more in a truck, by such a firm would not be good business. But firms of this type frequently pay out $100.00 to $125.00, per month for hauling. But for this fact a sale to such a firm would not be warranted. With this analysis of the purchasing power it is evident that the rating is not high but low.

Second, for the same reason a firm purchasing a truck of $1,000.00, or upward should have a rating of $5,000.00, to $10,000.00, second grade.

Third, there are certain classes of business such as, contractors, trucking contractors which have low ratings but a large earning capacity. These may be sold with safety when their net earnings are above $3,000.00, per annum.

Fourth, cars should be sold in periods of 6 to 8 months time, 8 to 10 or 10 to 12 months. The time should be made as short as possible. A motor truck like a team of horses is at the mercy of the driver. In the hands of a careful man it should have a lifetime of many years. In the hands of a reckless driver its lifetime can be reduced to months. Neither the maker, the agent, nor the discount company has any control over the owner of the truck. Consequently they should reduce the time of payments to cover a reasonable period of safety.

Fifth, down payment is one of the storm centers of the partial payment plan. We hold that it can be made elastic varying according to the financial standing of the agents. We have one fixed and invariable rule and that is that the manufacturer must be paid in full. The down payment is a greater factor in the sale than the average agent realizes. As an illustration we will say that an agent has a selling commission of 20 per cent; it naturally follows that he has to pay the manufacturer 80 per cent. Assuming after investiga-

tion that the discount company agrees to advance 40 percent, then the down payment should be 40 per cent, making a total of 80 per cent or the manufacturer's price. Let us assume that the purchaser of the truck says: "I can only pay 25 per cent down," the agent would then be required to pay out 15 per cent of his own money to bring the cash payment up to 40 per cent. We do not think this is good business. We feel that the agent should not invest a penny of his working capital in a truck on a time payment system.

Sixth, the purchaser having paid his 40 per cent gives his notes for the balance, 60 per cent of the purchase price. These notes are made in monthly payments the first one being due within 30 days after delivery of the machine. The rate of interest to be the current rate of the state in which the transaction is made.

Seventh, the notes are made in favor of the dealer who endorses them in blank and sends the paper to the manufacturer in lieu of cash. The manufacturer then sends the notes to the discount company which cashes them.

Eighth, these notes must be secured by chattel mortgage, lease or conditional sales contract, properly filed and recorded in the same manner as is done by the big machinery houses on tools and machines.

Ninth, the notes must be further secured by fire insurance policies to be taken out by the customer in favor of the agents.

Tenth, the agent's commission is withheld and repaid to the manufacturer or direct to agent pro rata as each monthly note is paid. We feel that it is highly essential that no part of the first down payment should go to the agent. The incentive of taking risks for ready money is thus removed.

Eleventh, when the manufacturer sells direct he must endorse the notes. When the agent makes the sale the manufacturer must guarantee that the notes are bona fide.

Twelfth, the charge for handling deferred payment paper should vary from 2 to 3 per cent on the selling price of the machine, being controlled by the time and risk.

This charge can be handled in several ways: The dealer can add the cost to the list price of the truck. The cost of deferred payment plan can be substituted for a cash discount. Thus the list would be maintained when machine is sold on time payment. When sold for cash the discount could be allowed.

In summing up the case of deferred payments one must consider the advantages and disadvantages of the plan to the manufacturer, the agent and the discount company. All three should assume responsibilities. The plan involves risks which each party to the arrangement must accept. Otherwise the arrangement would not be equitable or satisfactory. For a moment we will take up the advantages of each party in this plan. We will first consider the manufacturer. His advantages are as follows: It gives him volume; It puts him on a cash basis; it relieves him of the necessity of supplying working capital for himself and his agents; it enables him to sell every manufacturer and merchant in a community instead of a few.

The disadvantages must be enumerated as faithfully as the advantages in order to consider the whole subject fairly.

He might consider at first glance a contingent liability for any protection he might give the discount company. If the manufacturer's material guarantee is a fixed liability then the deferred payment plan is also. If on the other hand the maker's guarantee is not a liability then the deferred payment plan is not a liability.

The clerical expense in handling and forwarding the agent's notes.

The expense of sending a factory man around with a discount company man to the various agencies.

Any disagreements that should arise between the agent and the discount company over delinquent payments. None of these are of great moment when properly analyzed and understood. The question of contingent liability has been explained. The question of clerical work is of small moment as any one of a number of clerks already in the office can be assigned to this work until the volume has assumed profitable proportions.

The advantages to the agent are:

Increased sales; gives him an entire community to work on instead of a part; it puts him on the same basis as his large competitors who have sufficient working capital to sell on time payment and carry the paper themselves; it offers opportunities for aggressive salesmanship; it gives him all the working capital he can use without putting up his own money.

The agent's disadvantages are:

He must assume liability of all notes, as he must endorse them; as endorser he will push collection of notes; unless the notes are paid he does not get his commission; his commissions are paid monthly; he must begin legal proceedings for recovery of truck; he must see that accident insurance policies are properly issued; he must file the chattel mortgage in local office.

On the face of it it looks as if the disadvantages were numerous but on examination you will find that there is no resopnsibility attached to any of them providing the agent sells to a proper party. If he does not sell to a proper party then he is responsible and should take the loss. It is to make the agent careful and cautious that the entire responsibility of the transaction should rest upon him. Otherwise he would be liable to take risks which would lead to severe losses. If you go through the disadvantages item by item you will discover that the agent assumes no risks if he sells a truck safely. If he sells it unsafely then it is the rule of trade that he must suffer for his own carelessness. The advantage to the discount company is only one, i. e. the rate or profit on the business.

The disadvantages are several:

Assuming risks that no other banking institution will assume in unlimited amounts; the depreciation of the truck; the possibility of fraud; the possibility of defective construction which would weaken the financial responsibility of maker and agent.

Having frankly shown the advantages and disadvantages of the plan, it remains for the manufacturer, the agent and the discount company to decide whether they wish to go on with the matter. The one fundamental idea evident to all is that the plan should be an investment and not a speculation. If as an investment it will bring results, then it is a success. If not, it is not worth your while.

It is also plainly evident that the success of the plan depends upon the united support of all units working together. The agent selling to responsible people, the manufacturer being in touch with his agent is in a position to know whether notes given are bona fide, the discount company must be in a position to

take and carry these notes to maturity. This is the logical sequence of the partial payment plan.

Neither a banker nor a broker can handle this type of business successfully. But it requires men who are manufacturers and merchandisers, someone who is familiar with the problems of credits and collections who will make every effort to keep the truck sold rather than returned. We can advise and caution the agent in his deals. In fact we feel that functions of the discount company are not parasitic but constructional and trade building. The watchword should be with the maker, the agent and the discount house, not "many sales with poor risks" but "fewer sales with good risks."

Waverley Makes Washington-Baltimore Run

Driving a 1915 Waverley electric brougham, George M. Chescheir made a run from Washington, D. C., to Baltimore, Md., and return on one charge of the battery. The car started from the Municipal building in Washington, Fourteenth street and Pennsylvania avenue at

Waverley Electric Which Completed a Run from Washington to Philadelphia.

8:30 o'clock, and three and one-half hours later checked in at the city hall in Baltimore.

While the road to Monumental City is good macadam most of the way, there are numerous steep hills to be climbed and to further impede the progress of the car a strong northeast wind was blowing. Despite these handicaps, however, the Waverley carried its crew and passengers over the first 40 miles at a comfortable pace and without mishaps.

Beside the driver, Howard Fisk and the automobile editor of *The Washington Post* rode in the car as official observers, and in their sworn statement at the finish of the run, stated that none but the original batteries were used, and no extra charge of any kind was put in; the car covered the route of 80.8 miles entirely on its own power; no breakdowns occurred, and no tire changes or repairs of any kind were made. The car made the run each way in a little more than three and one-half hours actual running time. The battery used was a regular stock 42-cell exide battery.

Several other makes of electrics have made this run in the past, but as far as any official record is concerned it is the first electric to make the trip carrying three passengers.

Experts are of the opinion that the current consumed in a run of this nature is equal to enough "juice" to take the car over considerably more than 100 miles around the streets of Washington.

While it is doubtful if many owners of electrics will attempt to make this run, it should be borne in mind that it is practical, owing to the great improvements in batteries during the past three or four years.

It will be an easy matter, however, for an electric owner to run over to Baltimore or other points equally distant in the country and by putting the car on charge for an hour or two, and getting what is called a "boost," make the return trip in safety, and without the danger of being left out on the road.

The Waverley, when in high speed, during its test run, averaged 15 miles per hour.

Anderson Company Eliminates Garage Service

Announcement has just been made by the Anderson Electric Car Company, builder of the Detroit electric, that Detroit service facilities for owners will in the future be centered at the main station, 687 Woodward avenue.

Along with this announcement comes the information that garage and service, including storing, washing, polishing, charging, calling for and delivering cars, will be discontinued. This move is occasioned by the belief of the company that electric car garages throughout the city are now equipped to handle such work. The concentrating of service activities in that city is because of the great growth in the number of cars in service there. At present there are in and near Detroit more than 600 Detroit electric cars, and when orders now in the factory are delivered this number will be considerably increased.

This large volume of cars makes it necessary to have one centrally-located station where patrons may bring their cars for inspection or repairs. This central station is equipped with the most efficient apparatus so that service may be had promptly and satisfactorily.

In the past a major portion of the service and repair department has been maintained at the factory. It was found unsatisfactory because of the congestion it made at the plant. With reference to a decision to discontinue garaging of cars, careful investigation proved that several electric garages have been established in different sections of the city and all of them are thoroughly equipped and capable of handling this work.

Chicago Municipal Motor Trucks

In its report to Mayor Harrison, the Chicago Municipal Markets Commission makes the statement that the average cost of hauling in the city by motor truck is 11.25 cents per ton-mile, as compared with 17.75 cents per ton-mile by horse. This shows a saving of 36 per cent in favor of the trucks. The average cost of deliveries by department stores, grocery stores and meat markets, according to the commission, is approximately 8 cents by motor and 16 cents by horse. Analysis further shows that the average cost of operating motor trucks and delivery wagons, including both the gasoline and electric types of machines, is $10.97 a day, inclusive of all items of operation and maintenance, such as driver, garage, interest and depreciation. The average cost of doing equivalent work with horses is $16.75 a day, which represents the expenses of from two to three wagons with drivers.

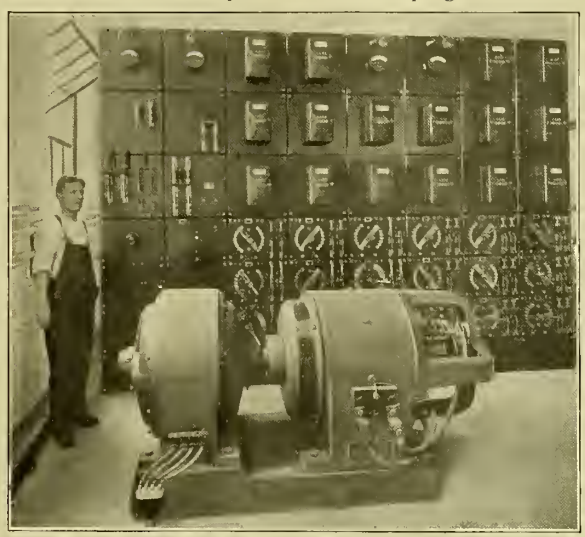
Central Station Modern Charging Apparatus

A Description of the New Vehicle Charging Equipment Installed by the United Electric Light & Power Company

BY FRED B. SCHAFER

IN THE issue of last January there appeared in these columns an article describing the garage charging equipment in use at that time by the United Electric Light & Power Company, Springfield, Massachusetts.

Since that time the steady increase in the demands upon that company's facilities has made necessary the abandonment of the garage equipment then described; a new and spacious garage building has been constructed, in which are housed the construction and supply departments; the building is equipped throughout with the most modern apparatus, the entire installation being made under the supervision of the general superintendent, J. A. Bolewine.



Charging Apparatus of the U. L. & P. Co. Installed by the Electric Products Co.

In the equipment and operation of this new garage, full advantage is taken of the "boosting" possibilities in the charging of storage batteries. This makes possible a very material reduction in the time required for charging, with the added advantage of largely increased radius of action and mileage per day of the electric truck.

With the two separate motor-generator sets, one of 250 amperes and another of 500 amperes capacity, it is entirely feasible to provide boosting capacity for one or two, or even a half dozen trucks, during the noon hour, when but a short time is available for this purpose, thus increasing to a large extent the amount of work the trucks may perform in a day's time; in addition to this, and regardless of the number of vehicles to be cared for, the motor-generator sets may at all times be operated at practically full-load and consequently at the point of highest efficiency. It is equally feasible to operate either of these sets alone, or to run them in parallel, when the total capacity is required.

The switchboard as illustrated was manufactured and installed by Electric Products Company, Cleveland, Ohio, and is specially designed to meet the actual working conditions prevailing in this garage. It provides three 100-ampere, three 75-ampere and ten 50-ampere charging circuits. These charging circuits and all portions of the complete board are mounted on separate uniform sized slate units, thus providing a highly flexible system of construction, in that switchboard units of the same size and character may be added as required.

To care for the very high boosting rates employed, the switchboard is equipped with two sections of transfer receptacles, in connection with which the use of "plug-in-cords" accomplishes the paralleling of the regular charging circuits and gives the combined capacity of the circuits when necessary. For instance, by paralleling one 100-ampere and one 75-ampere circuit, a maximum charging rate of 175 amperes may be obtained.

The plug-over units may also be used for discharging one or two batteries at a time, through the resistance of the rheostat; or one battery may be discharged into another, thus utilizing all current and resulting in a material saving in the course of a year's time where batteries are frequently built up and renewed.

Each charging unit of this board is provided with a line switch, fuses, current regulator arm, and voltmeter and ammeter receptacles. The rheostats are provided with a large number of contact points, thus affording extremely close regulation and control of charging rates. For the high-capacity circuits, a special design or regulating arm is used; this insures an exceedingly low voltage drop between the contact surfaces, as well also as freedom from heat. The design has proved highly satisfactory for current ratings up to 300 amperes.

The switchboard is equipped with two sets of meters; the pair at the left consists of voltmeter and ammeter, and indicates independently the voltage and total current being delivered by the two generators. The other pair indicates, also independently, the voltage and charging rate of the individual batteries on charge. These indications are secured by inserting a meter plug into the corresponding receptacle on the charging circuit unit, or the generator control unit, of the board. The system gives the operator at all times a definite knowledge of the condition of any battery on charge and obviates the necessity for going from car to car to note these readings or to make adjustments of charging rates. All readings are taken and all adjustments made at the switchboard itself.

It will be noted that each charging circuit is equipped with an individual watt-hour meter for measuring the current consumed by each battery. Charges for this service are based upon current consumption of the batteries, and the arrangement described affords an accurate record of the current consumed by each battery, each charging circuit being permanently assigned to a certain battery or vehicle.

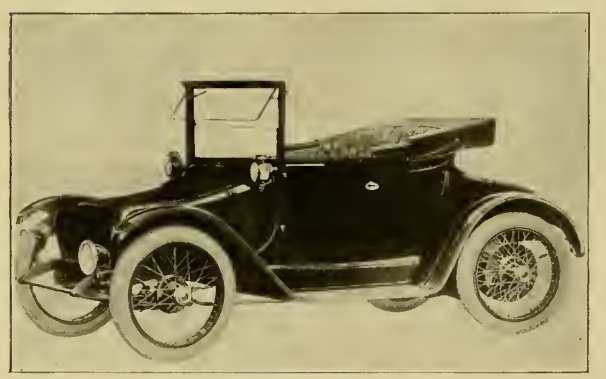
Resistances are all of the heavy cast-iron grid type, securely mounted on a substantial angle iron

structure. The entire rheostat structure is composed of non-combustible materials. The ratings employed are sufficiently conservative to permit of very high overloads. All connections between grid resistances and contact points on the switchboard are bolted and are therefore not affected by heat due to overloads.

A comparison of the illustrations of the old and the present charging equipment of this company will serve at a glance to show the very great progress being made, both in style of equipment and methods of charging. It is due in a very large measure to the far-sighted policies of the central station companies, and to the research and development work of the manufacturers of storage batteries and charging apparatus that such accomplishments, with their wonderful influence in popularizing the electric vehicle, are made possible. It is these combinations of equipment and thorough service that are causing the electric vehicle industry to go forward, especially in the commercial field, by leaps and bounds as compared with the progress being made in other lines of transportation.

New Model Detroit Roadster

The "Detroit" three passenger cabriolet, model 50, shown in the illustration is so designed that in inclement weather the top may be raised, completely protecting occupants against rain or snow, while in pleasant weather



Detroit 1915 Model Cabriolet.

the top may be lowered, offering all the pleasures of an open roadster. All panels and battery hoods are of sheet aluminum and the top is of a fine grade leather. This car seats three people—two on the wide rear seat and one on the auxiliary front seat.

Dimensions include a rear seat—width 50 inches, depth 18 inches. Front to rear window 53 inches. Top of cushion to roof 40 inches. Door width 24 inches. Measurements over all—height 88 inches, width 67 inches, total length 11 feet 10 inches. This model is upholstered in superfine broadcloth or hand-buffed leather in blue, green or maroon shades, also exclusive imported whipcords and bedfords.

The roadster has a tread of 56 inches (standard).

Regular non-wash battery—42 cells, 15 plate—used in this car does away with the expense and annoying delay of washing out lead batteries of the old type. An Edison battery of 54 cells A-6 type optional. Axles are full floating and equipped with Lanchester type worm gears. In this axle the worm is mounted *below* the ring gear and runs in a bath of oil, assuring perfect lubrication. The front axle is a drop forging of the I-beam type.

The operating levers are mounted on the side of the car in horizontal position, one above the other. The longer (steering) lever is operated by the right hand and the shorter (controller) lever by the left. When the driver leaves the car these levers may be turned up out of the way and locked, preventing use of the car without the owner's knowledge. Three separate sets of brakes are provided, operating independently. The two sets of foot brakes, on the rear hubs, are of the internal expanding type, 16x1¼ inches. Between the two foot pedals is a third pedal. Pressure on this applies both rear hub brakes, locks them and automatically cuts off the power. The electric hand brake operates on the motor and is applied by a slight backward movement of the controller lever.

The roadster has a wheel base of 100 inches. The tires are large, of either non-puncturable Motz cushion type or Goodrich cord pneumatic. Cushion tires 36x4½ inches, pneumatic tires 34x4½ inches. Fenders are full aluminum of the oval crown design and are skirted to the body so as to completely protect it against splash or mud.

This model has five speeds ranging as follows: 5, 8, 13, 17 and 20 miles per hour. Owing to the large battery capacity and high mechanical efficiency long mileage is assured ranging from 50 to 85 miles per charge.

New York Issues List of Charging Stations

To satisfy a demand for lists of garages and charging stations, the United Electric Light & Power Company of New York City is distributing a list of garages and charging stations to the owners of electric vehicles operating in Greater New York and such other owners as request same.

The list is printed on heavy cardboard, designed to be tacked firmly in the vehicle in order that the operator may determine at a glance the nearest station for boosting his vehicle when such is required, giving consideration to the current facilities available at the station in question.

The company announces coincidently with the distribution of this charging list a reduction in the minimum monthly charge on the storage-battery rate, from $25 to $10 per month after November 1. This reduction will be welcomed by the owner of a low-capacity truck or passenger car, privately garaged, which does not require enough charging to exceed the present minimum charge at the existing low metered rate.

This reduction of the minimum charge is in conformity with reduction of the storage-battery rate which has taken place from time to time during the past several years, the last being effective May 1, 1914, when a substantial reduction was made in the graduated scale.

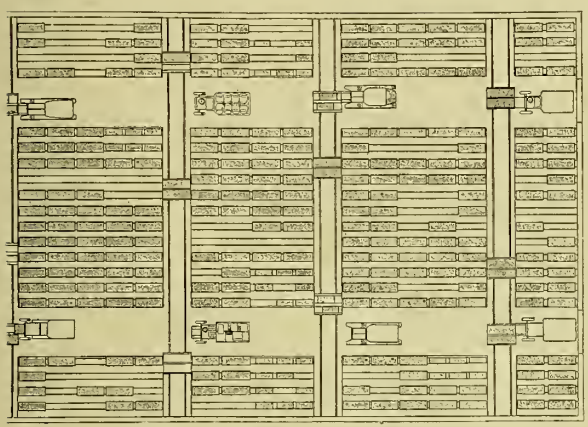
New Truck Company Tests First Model

The Dunlap Electric Truck Company, Columbus, O., which was recently organized with a capital of $20,000, has completed its first model, which was inspected by representatives of the General Electric Company. The truck is chain driven and carries a load of 750 pounds. In the test it carried 1350 pounds. It develops a speed of 12½ miles ordinarily, and has an emergencyspeed of 15 miles. The axles are tubular and carry the F. & H. wire wheels. The incorporators of the company are T. C. Dunlap, George H. Hedhes, Stewart A. Hoover, Herman R. Tingley and M. E. Heasley.

Klingelsmith Multi-Battery System

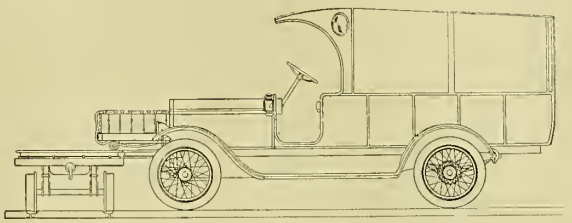
Unlimited Mileage, Constant Service, Maximum Battery Life

AMONG engineers and others connected with the motor car industry it has long been recognized that the electrically propelled vehicle has many inherent advantages over other mechanically propelled vehicles, and in particular that the electric car is especially adapted for city use and for work in congested traffic and other places where frequent starts and stops are necessary. Because of its high torque at low speed, the electric motor is particularly suited for quick acceleration which is necessary under such conditions; and where initial cost, cost of maintenance, and cost of operation are also carefully considered, as in the case of commercial vehicles, the demand is also great for a power vehicle which is low in its first and maintenance costs, and which will operate with a maximum efficiency at different speeds. The electric vehicle answers these requirements, and has other advantages.



Plan of Multi-Battery Service Station.

The great disadvantage of the electric vehicle has always been its limited mileage on a battery charge, which is, of course, due to the great weight of battery necessary for a given output, and the practical limits which are reached in the size and weight of the battery equipment. Vehicles, of course, have been built with batteries of great capacity, but at the expense of great weight; which means increased cost of operation in carrying around the extra dead weight, and increased maintenance cost because of the extra load on the tires, axles and other parts of the vehicle, in addition to the increased maintenance cost of the battery itself; and such a vehicle is necessarily limited in the proportion of its carrying capacity to its own weight. But even a battery of large capacity and a long discharge requires a long charging time, so that a vehicle so equipped suffers the same disadvantage as a vehicle with a smaller battery, of long idle periods for charging, during which time the vehicle cannot be used and the interest on the investment is being lost. Attempts have been made to overcome this last disadvantage by "boosting" a battery on charge, or charging it at an abnormally high charging rate; with consequent injury to the battery and therefore higher maintenance cost and shorter life. In the operation of an electric vehicle, time is also lost in giving the batteries the care and attention which they require in addition to the charging, such as washing the plates, renewing electrolyte, flushing, etc., and in removing and replacing the heavy batteries in their more or less

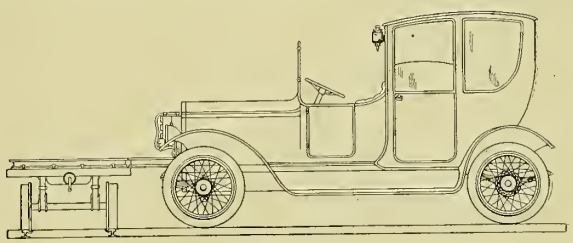


Delivery Truck of Multi-Battery System.

inaccessible positions in the vehicles. It is found, however, that the necessity, or desire, of keeping the vehicle continually in service, which is important in the pleasure car field, usually requires this service to be done at night, when labor is difficult to procure; and when the running time of a commercial vehicle, which can be used for night hauling, is also sacrificed; so that the batteries are neglected and great depreciation results.

Charging the battery inside the vehicle also causes rapid depreciation of the battery and of all exposed parts of the car, due to the fumes and gases from the electrolyte solution; and in addition the life of the battery is shortened by over-discharging in the effort to obtain maximum mileage, or when in haste to get the use of the car, or due to the installation of a battery not suited to the particular service it is performing. It is frequently stated that in the present system 95 per cent of all troubles with electric vehicles are directly or indirectly connected with the battery, which gives the users and the public generally the idea that the battery is wrong. This is a great mistake—the batteries are all right and as nearly perfect as anything else in the mechanical and industrial world; the fault lies entirely in the methods of their use.

In order to overcome all the foregoing disadvantages attendant upon the operation of an electric ve-



Electric Taxicab.

hicle and in order to increase its range of operation and usefulness and its efficiency, the multi-battery system has been devised. This system is a new development in the electric vehicle field and is the invention of Joseph M. Klingelsmith of Chicago, who has spent

five years in experimenting with and perfecting it after having been identified for twenty-five years with electrical engineering and with the storage battery and electric vehicle industry. This system is designed to eliminate the 95 per cent of battery troubles to which all of the present vehicles are subject, and to provide, instead of the limited mileage at present obtained, unlimited mileage and service at all times. It contemplates the construction of a vehicle with a battery designed to be readily removable and replaceable therein, so that a discharged battery can be quickly taken out and a fully charged one substituted, with practically no loss of time in the running of the vehicle. The battery is mounted permanently in a small car or carrier, with flanged wheels and ball bearings, which rests on a small T-rail track in the battery compartment in the vehicle, and is run out onto a platform, or a transfer truck with rails leading to the charging platforms; the change from a discharged to a fully charged battery being accomplished in less than a minute. These battery carriers are interchangeable in all and any type or size of electric vehicles or trucks for whatever purpose or of whatever design or style, and the battery carriers enter all vehicles in front; which is the only similar part of all pleasure cars and trucks. Batteries assembled in the battery carriers may be of any and every voltage and ampere rate of discharge, as required for the highest efficiency and control of speed, pulling power or mileage desired. The batteries are charged outside of the car and at a low charging rate without sacrificing the running time of the vehicle, and all necessary inspection and attention can be given them before they are replaced; and it is estimated that this alone will increase the life of the batteries from one and one-half to two times. It is evident also that if battery renewals can be readily made without interfering with the use of the vehicle, the batteries need not ordinarily be discharged beyond the point of their best power and maintenance efficiency, but can be removed for replacement by fresh ones when not fully discharged, which will also greatly prolong their life; and in addition also, batteries depreciated 20 to 30 per cent, which are now scrapped, can be used up in this system on ten to thirty mile trips, getting more mileage out of the old batteries than is now obtained from new ones.

In all private installations of electric cars or trucks, whether large or small, private battery service stations will be established by the owners where batteries will be kept in reserve fully charged or in process of being charged for replacement of the batteries which are in use; and preferably also, where the system is sufficiently large to include a considerable number of vehicles, which may be of different load capacities, the batteries may embrace units of different sized cells and different numbers of cells, so that batteries may be provided of differing ampere-hour output and of different voltage. Since the battery carriers are, however, all alike, these batteries will be interchangeable in all of the vehicles included in the system, so that any vehicle may receive any battery. The purpose of this arrangement is that where large capacity and small capacity vehicles are operated together, which would ordinarily be provided with batteries proportioned to their respective load capacities, the batteries may nevertheless be interchangeable, so that if the smaller vehicle should be required to perform an extra heavy service on some occasion it might be sent out with the larger capacity battery; and conversely, if the larger vehicle should be required to perform a short haul or other light service, or if it were necessary to meet an emergency, the larger vehicle could be sent out with the smaller battery. In other cases where additional speed might be desired for a particular service, a battery of higher voltage than that ordinarily used might be supplied for one of the vehicles; and in cases where a high discharge rate might be necessary, as, for example, in climbing hills or operating through mud, snow or other heavy traffic conditions, a battery of larger cells would be desirable. In some cases, also, a vehicle might be kept in continuous operation performing two kinds of service, as, for example, it might be started out each morning on a long haul, and returning, might leave again in the afternoon on a short haul. In such case, then, it could be equipped in the morning with a large battery, or one with large cells; and starting out again in the afternoon the large battery could be replaced by a smaller one in the vehicle and placed on charge to remain all the rest of the day and all night, if necessary; while the vehicle returning in the evening might leave its small battery to be also charged during the night, or to be charged the following morning while the large battery would be in service on the road.

In all general use by the public of electric cars or trucks under this system, public battery-service stations will be utilized, where charged batteries of all necessary capacities will always be available and where the cars can be run in and the batteries exchanged with practically no loss of time whatever, the owner getting a charge ticket for electric current and battery rental, as all batteries will be owned by the service stations. This system relieves the owner of the car or truck from his investment in batteries, their depreciation, care and troubles, and yet secures to him unlimited service at less than half the present cost. It means unlimited mileage and the value of the battery doubled and trebled, added to the present well-known and important advantages of the electric.

The illustration shows the floor plan of a Multi-Battery System service station, showing only the method of handling the batteries and leaving out details such as electric charging apparatus, elevator, overhead trolley for supplying current to pleasure cars and trucks without batteries, and overhead piping system for distilled water for flushing the batteries. The batteries, each assembled complete in its wheeled carrier, are shown resting on parallel tracks from which they are delivered onto small wheeled transfer trucks, arranged for sidewise travel in the transfer alleys across the building. These wheeled transfer trucks can also be raised and lowered to provide for the varying heights of the battery compartments in the different types and sizes of vehicles.

The dimensions of this service station plan as shown are 100 feet wide by 160 feet deep, affording storage space for about 360 batteries and a capacity for supplying batteries to about 900 pleasure cars and trucks; while battery changes can be made at the rate of about 250 per hour. By storing batteries on the upper or lower floor and increasing the number of transfer alleys this capacity can be increased to take care of 1,500 cars and trucks and change batteries at the rate of 400 per hour.

Private service stations or smaller public service stations can be planned on the same lines, using as much or as little space as may be required for the number of vehicles to be handled.

Educational, Insurance, Legislation and Membership

Committee Reports Presented to the Fifth Annual E. V. A. Convention

Educational Courses.—The 1912 committee on the establishment of courses of instruction in electric vehicle practice pointed out the need of better trained and more dependable men for electric vehicle garage work and analyzed the educational field in which special training courses could advantageously be undertaken. The result of the committee's work was the incorporation of a course in electric vehicle practice in the program of the West Technical High School of Cleveland, Ohio.

The same committee for the year 1913 reported that the educational experiment in Cleveland was working out well and was giving renewed hope for the establishment of similar courses in other cities, particularly in those in which electric automobile factories are located. Some of the members of the committee had visited the Cleveland Technical High School and assisted in the furtherance of the undertaking, in which Professor Short of that school had shown great interest.

The influence of the activities of these committees projected itself into the work of the educational committee of 1914, for the latter received an interesting statement from Dean H. M. Raymond of the Armour Institute of Chicago, together with an outline of a course in electric vehicle practice which he proposed to include in the curriculum of that school.

The committee attaches sufficient value to the suggestion to reprint the synopsis of the course as proposed by Professor Raymond, in the hope that it will stimulate educators in other institutions to become interested in the subject and to consider the carrying out of similar steps. In this work the sections can show themselves quite helpful to the objects of the association by co-operating with the public school authorities in their respective cities, to the end that interest in the matter might be aroused and the subsequent work of the educational committee be facilitated. This effort should not, however, be restricted to the technical high schools. In so far as it can be done, other educational institutions like public and private trade schools and Y. M. C. A.'s should be approached with the idea of securing their assistance along the same lines.

COURSE IN ELECTRIC VEHICLE PRACTICE.
Proposed by H. M. Raymond, Dean, Armour Institute, Chicago.

1. Development of the electric vehicle.
2. Fundamental treatment of the direct-current circuit and electrical units.
3. The direct-current generator and operation.
4. Fundamental treatment of the alternating-current circuit, and alternating-current generators and motors.
5. Theory of the direct-current motor.
6. Construction of commercial types of direct-current motors.
7. Operation and care of direct-current motors.
8. Construction and operation of commercial types of motor controllers.
9. The storage battery.
10. Care of lead storage batteries.
11. Care of Edison storage batteries.
12. Charging stations and direct-current equipment.
13. Motor generator sets and mercury arc rectifiers.
14. Indicating instruments.
15. Recording instruments.
16. Electric wiring.
17. The care of wheels, rims and tires.
18. The chassis, its construction and upkeep.
19. Hints about good driving.
20. Comparative cost data, records, etc.

Aside, however, from the strictly technical course of instruction above referred to, which aims to train electric vehicle engineers and competent operators, there is need of another course of less technical scope and bearing more directly on the training of electric vehicle salesmen. It should be the concern of the educational committee for the ensuing year to give practical shape to this suggestion. A synopsis would first have to be outlined, and when this has been approved, the text developed and finally worked out in detail. When the technical and the salesmen's course have been fully determined, it may become advisable to print the same in pamphlet form.

There is no question that if in all of the larger cities men could be obtained readily who have adequate knowledge of the design, construction, function and operation of electric trucks and vehicles, their quick availability would help to induce business people to buy such trucks and vehicles. Until, however, the demand for these specialists in the automobile field has made itself felt to a larger degree than is the case at present, schools will naturally be reluctant to add special courses to their curriculum appertaining to electric vehicle practice only; they might be far more ready to incorporate courses treating the whole subject of automobile design, construction and use, including in them proper references to the electric vehicle.

It would seem, therefore, that simultaneously with, if not even preceding the efforts for co-operation with educational institutions, should be well-directed endeavor of the educational committee to induce central station managers and manufacturers of electric automobiles, automobile motors and storage batteries to train in their own places an adequate number of specialists in electric vehicle construction and operation. This should be accomplished so much the more easily as it could be shown to be to the direct financial interest of central stations and manufacturers to popularize the electric vehicle. The General Electric Company, the Westinghouse Electric & Manufacturing Company, the General Vehicle Company, among manufacturers and the New York Edison Company and the Commonwealth Edison Company, among central power stations, are already maintaining educational courses, and in co-operation with them special courses for the purposes above mentioned could readily be worked out.

All of this, of course, will require the close attention for some time of someone who has had practical experience in the field, the ability to develop the work along the desired lines and to write it up in clear and concise language, and the knack to secure co-operative effort from busy business men. He should also build up a body of appropriate lantern slides, and in connection with it develop a short lecture which could be given in schools, Y. M. C. A.'s and similar assemblies, all for the purpose of creating a wider and more intelligent public interest in the electric vehicle. With such a man at hand, the committee could place his services at the disposal of the various interests and thereby secure in a short time that which it might otherwise take a number of years to accomplish. If the carrying out of the proposed plan will gain to the Electric Vehicle Association and through it to its members the advantages herein stated and implied, the sooner the work is undertaken and the more forcefully it is pushed to its completion, the better it will be for all concerned.

The committee, therefore, respectfully suggests that either from the general funds of the association or by special subscription among the interested membership, the necessary moneys be obtained to secure the services of a competent assistant and lecturer for the educational committee which is to be appointed by the new board of directors. All members of the committee will gladly give of their spare time to co-operate with and supervise the work of such assistant and lecturer, but it can hardly be expected that any member of the committee will have sufficient spare time available himself to enter into the painstaking and detailed work that is involved in the proposed plan.

It must also be borne in mind that the electric vehicle at the present time plays only a relatively small part in the general automobile industry. Enthusiasm for and honest belief in its future possibilities and development must not unduly magnify the present needs of specially trained electric vehicle salesmen and operators, nor blind one's self to the fact that such enthusiasm and faith is not yet shared by the general automobile using public. It will, therefore, require persistent work and well directed effort to gain for the electric vehicle the place which it deserves in the automobile field, and for the members of the Electric Vehicle Association the benefits for which the association has been formed.

Only one meeting of the committee was held during the year, attended by most of its members. The wide geographical distribution of the members and the further handicap that they would have to pay out of their own pockets the traveling expenses incident to attendance at committee meetings, made it impracticable to arrange for more meetings. In defense of the committee for having done only some constructive thinking but no constructive acting during the past year, it should be said, however, at the direction of the chairman, that largely his inability to devote the necessary time to committee meetings and to active work is responsible for the committee's failure to have accomplished a larger measure of good work.

Insurance, Day Baker, Chairman:—During the past year your committee has been able to secure only one concession on insurance of electric vehicles. Co-operating with the Pyrene Manufacturing Company, a ruling was obtained whereby many of the fire insurance companies gave a reduction of 15 per cent. from standard automobile rates where vehicles were properly equipped with suitable fire extinguishers.

Your committee believes that if the members could centralize in placing their insurance with those who make special rates on electric vehicles, that we would be able to maintain and possibly better the rates which we secured in 1912-13. At the present time the volume of business to any one company is too small to receive much consideration, therefore we should centralize our efforts and reward with business those who are willing to recognize the good points of the electric vehicle.

Legislation, P. D. Wagoner, Chairman—We believe that much relief will be felt by those interested in automobile matters because of the present status of motor vehicle legislation.

Twelve states have held regular sessions during 1914, viz: Kentucky, Maryland, Mississippi, New Jersey, New York, South Carolina, Virginia, Massachusetts, Rhode Island, Louisiana, Georgia and Ohio.

No drastic or particularly objectionable measures have been enacted in any state, except a rather drastic license tax in Massachusetts, and a number of bills approved by automobilists have become law.

Of the fourteen bills introduced in Kentucky, only one passed,—a general measure which fixes nominal registration fees.

The only important new law in Maryland regulates the speed of motor vehicles, prohibiting speed over 35 miles an hour, and limits the speed of commercial vehicles according to weight.

One of the provisions of this law limits the weight per inch of tire to 800 pounds without the special permission of the State Roads Commission, the city authorities, or the county authorities, in the cases of roads, streets or highways under their respective jurisdictions.

Other provisions limit the width of any motor vehicle to 90 inches, and the weight of the truck and load combined to 14 tons.

Speed contests, under any circumstances, are prohibited from taking place upon any highway in the state.

Maryland also has a law that no person operating or in charge of any electric motor vehicle shall allow the same to stand unattended on any highway without securing or locking the lever or other device by which the same is started, or taking other reasonable precautions to prevent such vehicle being started by unauthorized persons.

Mississippi enacted a new registration law to replace one declared unconstitutional, the receipts from the registration to go for the up keep of roads.

In New Jersey a bill was passed authorizing park boards to limit the speed of motor vehicles and to exclude them from park drives.

A bill was also passed authorizing the commissioner of motor vehicles to increase the number of special inspectors to 30 and to appoint men from other state departments upon request.

The administration measures to exempt motor vehicles from personal property tax and to increase registration fees were defeated.

In New York a bill was passed making it a misdemeanor to violate traffic rules in New York City.

In the last report of the Committee on Legislation reference was made to the New York State Motor Vehicle Legislation Commission formed last year, this commission having been instructed to confer with similar commissions appointed from New Jersey, Connecticut, Maryland, Delaware, Maine, and Massachusetts, having in view the making of uniform laws for eleven Eastern states. It was found, however, that this uniformity could not be brought about at that time for various reasons, the result being that the New York commission discarded the recommendation of the joint commission. Senator Loran H. White introduced two bills in the New York legislature, and it was thought that these had a good chance of being enacted into law during the 1914 session. These bills contemplated the repeal of the "Callan Act." The chief radical changes from all other motor vehicles acts were the elimination of definite speed limits; a registration fee of $2 for all motor vehicles; the placing of motor vehicles on an equal basis before the tax boards as personal property with no special taxation features whatever, and the imposition of penalties for violations.

These two bills failed of passage, owing chiefly to pressure of work in the legislature, but it is expected that they will be of some benefit to the motorists of the state, as they furnish a strong argument and precedent in favor of more reasonable and practicable automobile legislation.

On July 7, last, Dock Commissioner R. A. C. Smith, at the request of the Merchants' Association of New York held a hearing to consider discrimination against automobiles and auto trucks in ferry charges. This movement was also supported by the National Automobile Chamber of Commerce, Inc., the Motor Truck Club of America, the Jersey City Chamber of Commerce, the Automobile Dealers' Association, and individual owners. The City, the Trunk Line Passenger Association, and the ferries were represented.

The Merchants' Association presented facts and schedules in support of the assertion that discrimination is practiced by the ferries against motor vehicles. It pointed out that the same kinds of vehicles travel on practically all the Hudson River ferries so that there would appear to be no good reason why tariff schedules should not be uniform. Instead of this, motor trucks are rated according to length on one ferry and according to tonnage on another. It was asked that a uniform system of rating be established. It was made clear by the Merchants' Association that they were attacking no particular rate and advocating no special basis of charges. All that was urged was a readjustment so that tariffs would be reasonable and not discriminatory.

In this connection, the following quotation from "Greater New York," the Association's bulletin is of interest:

> "The contention of The Merchants' Association is that all rates should be fair and non-discriminatory. It is the discrimination against the automobile truck with which we find fault. There is no doubt but that eventually the motor vehicle will supplant to a very great extent the use of horse-drawn vehicles, and the tariffs of the various ferry companies should be so constructed as to make proper provision for this class of conveyance, and the rates should be so adjusted as to encourage, rather than discourage, the use of the motor car."

The ferry lines requested of the dock commissioners an extension of 60 days in which to analyze the exhibits filed, and it is to be hoped that they will do something constructive in the way of a tariff that will eliminate the alleged discrimination.

The only bills enacted in South Carolina were local measures permitting special automobile licenses in Beaufort and Oconee counties to increase the road fund.

Virginia now prohibits driving a truck fitted with cleats or lugs which will cause injury to specially treated road surfaces.

Three other Virginia laws permit local authorities in Accomac, King William and Spottsylvania counties to levy special license taxes to provide funds for construction and maintenance of roads in these mountainous regions.

Notwithstanding the opposition, the Massachusetts bill abolishing the present flat registration fee of $5.00 for every commercial motor vehicle and substituting therefor a fee of $5.00 for vehicles of one ton carrying capacity or less and $3.00 for each additional ton or fraction of a ton of carrying capacity, passed the legislature and was signed by Governor Walsh the last week of June.

The new law does not go into effect until January 1st, next. It is known as House Bill No. 2,470, and is a new draft of original House Bill No. 70. Efforts to convince the legislature and Governor that the bill was unnecessary and objectionable resulted in securing a reduction of the fees from $5.00 for each additional ton of carrying capacity to $3.00

Massachusetts has also enacted laws prohibiting the use of muffler cut-outs and the making of unnecessary noises by cutting out the muffler or otherwise, in the thickly settled

parts of cities and towns; permitting the electors of Nantucket Island to exclude automobiles from the roads of the Island, and permitting the operation of motor vehicles on the Lord's Day. This latter enactment removes an old "blue law" from the statutes.

A bill was passed by the Rhode Island assembly fixing the registration fee for every commercial motor vehicle and every motor truck, regardless of the horse-power, at $7.00, and for all of the motor vehicles owned by or under the control of any manufacturer of or dealer in motor vehicles, at $50.00.

The registration fees for passenger automobiles were graded according to horse-power, amounting to $5.00 for 20 horse-power or less, the maximum being $25.00 for the registration of an automobile in excess of 40 horse-power.

The Louisiana legislature passed a general automobile bill fixing a flat registration fee of $7.50 for motor trucks. This bill provides that the fees collected shall be applied to improvement of the highways.

A bill was also passed prohibiting the exacting as a condition precedent to the operation of an automobile, that an owner or operator should be required to take or file a photograph.

The Georgia legislature has not yet adjourned. One of the bills now pending provides for nominal license fees, the fees collected to go into the highway fund. This bill also provides that these fees shall be in lieu of any other ad valorem state tax.

In Ohio a general license bill placing fees at a nominal figure to replace last year's bill declared unconstitutional, was passed by both Houses. The General Assembly adjourned February 16, and the bill was presented to the Governor on February 26. Without objection or approval it was filed in the office of the Secretary of State on March 9, 1914. An extraordinary session of the Ohio legislature convened July 20, but no reports have been received of the introduction of any automobile measures.

Among other states, Massachusetts, New York, Kentucky, Maryland, Virginia, New Jersey and Rhode Island now have laws requiring lights on all motor vehicles at night.

In the states in which legislative sessions have been held this year, no bills have been passed requiring any specific or proprietary device on automobiles, or inflicting occupational licenses upon manufacturers or dealers, nor, with the exception of local license to raise road taxes in two counties of South Carolina and one in Virginia, have any laws been passed allowing the imposition of local license and registration fees in addition to state registration.

Motion Picture Film, W. C. Andrews.—In the early part of 1914, S. G. Thompson, chairman of the meetings and paper committee, conceived the idea of producing an amateur motion picture, which by circulating among various engineering societies, clubs and other fertile fields would boost the electric vehicle where lectures or talks might prove impracticable. It was proposed to give the film a personal interest by having as actors prominent members of the Electric Vehicle Association. The plan was submitted to Thomas A. Edison, and met with such hearty approval that Mr. Edison offered to have the film made and to present it to the Electric Vehicle Association in the name of the Edison Storage Battery Company.

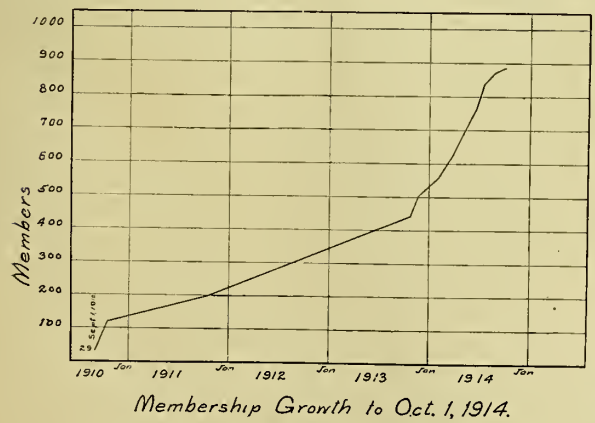


Fig. 4—Curve Showing Membership Increase.

The picture was first shown publicly at the June smoker of the Electric Vehicle Association, and received considerable publicity in the technical press. This publicity has resulted

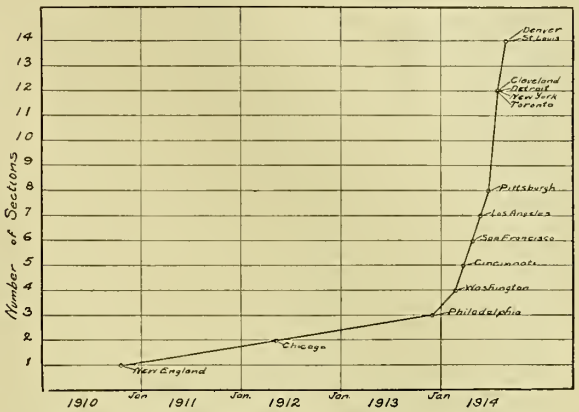


Fig. 5—Curve Showing Increase in Sections of the Association.

in a great many requests for the film to be shown at local meetings of the Electric Vehicle Association, meetings of sections of the National Electric Light Association, Electrical Expositions, Educational Institutions, etc. The demand, in fact, was much too great for a single film, and the Electric Vehicle Association has purchased an additional film, and the National Electric Light Association intends buying one for its lecture course. Requests already received indicate that these films will be in practically continuous service during the coming season.

The original film has been shown at the following meetings. During the National Electric Light Association Convention in Philadelphia, the film was shown at a moving picture theater in Willow Grove Park on the evening set aside for the Jovian celebration. It was shown at the October meeting of the Chicago Section of the Electric Vehicle Association, and at the October convention of the Vermont Electrical Association at Brattleboro, Vermont. There are at present several requests for the films awaiting advice as to the specific date on which they can be furnished.

Standardization Committee, E. R. Whitney, Chairman.—When this committee was originally empowered to take up the question of standardization, the electric vehicle was receiving very scant consideration in other organizations, and although it was appreciated at the time that the Society of Automobile Engineers was the logical body to act on questions of standardization practically no consideration had been given by this organization to the electric vehicle, and in order that this branch of the industry receive proper consideration, it was considered imperative that the E. V. A. become active in this particular branch of the work.

During the last year, however, the electric vehicle, and the members of the Society of Automobile Engineers associated with electric vehicle manufacturers, have taken a much more prominent position in the society, due both to the growing importance of the electric vehicle and the pressure which has been brought to bear by the electric vehicle contingent.

A special committee has been appointed to be known as the electric vehicle division of the standards committee. A large number of the members of your standardization committee who were members of the S. A. E. were appointed as members of this committee.

A meeting of the committee was held on June 2, and in recognition of the position which your committee had already made for itself, all members were invited to attend.

At this meeting it was pointed out that it was important to decide whether the S. A. E. or the E. V. A. committee should take the initiative in matters of standardization and the matter was thoroughly discussed, and the concensus of opinion, including practically the unanimous opinion of members of the E. V. A. committee present, was in favor of the S. A. E. committee taking the lead.

Accordingly, a recommendation was made to the board

of directors that this association formally approve of this line of action, and a resolution was adopted.

The S. A. E. committee has been divided into sub-committees, as follows:

Motors and controllers, W. E. Holland, chairman; H. S. Baldwin, T. H. Schoepf.

Batteries, wiring and charging appliances, G. W. Wesley, chairman; Bruce Ford, E. J. Ross, Jr., W. H. Conant, E. R. Whitney.

Lamps, R. S. Fend, chairman; Ernest Lunn, Benj. Jerome.

Speed and mileage ratings, F. A. Whitten, chairman; E. J. Bartlett, William P. Kennedy.

Tires, E. R. Whitney, chairman; J. H. Hertner, F. A. Whitten.

It will be recognized that in view of practically all members of the committee having been given place on the S. A. E. committee, the interests of this association will be properly taken care of and there will be the additional advantage due to the undoubted prestige of the Society of Automobile Engineers.

The charging plugs adopted as standard at the last convention have been formally adopted as standard by the Society of Automobile Engineers, the American Institute of Electrical Engineers, and the Incorporated Municipal Electrical Association of England.

Coincident with the distribution of these letters, which in all numbered over 4,500, correspondence was carried on between the home office, the members of the committee, the chairman of the section membership committees, which were

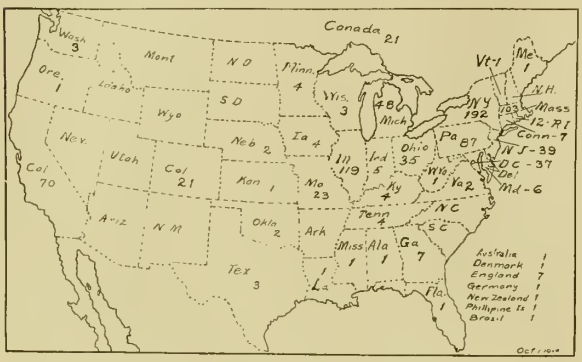


Fig. 6—Geographical Distribution of Members.

formed from time to time, and members of the association in many points who were in a position to aid in doubling the membership. The endeavor was made to keep this watchword prominent before the membership committee and prospective members.

As fast as fifteen or more members were affiliated in a given district, the matter of a section was taken up and we are proud to report that the number of sections now stands at fourteen. From the enthusiasm and efforts which have been expended, we have every reason to believe that those formed at present will grow both numerically and in real influence in electric vehicle affairs. A number of sections are under consideration and the early part of the coming administration should see the number of fourteen increased to twenty-five.

Acting upon the suggestion of one of the members of the committee, your chairman started a "round robin" letter, the purpose of which was to give each member of the committee an opportunity to explain the conditions, efforts expended and results gained in his territory. With twenty-five members of the committee scattered all over the country, it took from March 12 to August 15 for this bird of enthusiasm to complete its itinerary, with the aid of a postal card follow-up. The information and views contained therein vary considerably according to the present status of the electric vehicle business in the locality concerned but it was easy to see a very promising future in every one of the comments.

The membership list referred to above was compiled from the corrected records and practically one thousand copies of this list of directors, officers, committees and members of the E. V. A. A. were distributed. A letter accompanied this list, asking each member to look through the names enrolled in his territory and to make members of those eligible who were not listed therein.

Two advertisements calling attention to the advantages of membership in this association were placed in the *Central Station* and *Electrical Merchandising*, in the issues preceding and immediately after the annual convention of the National Electric Light Association. Under the heading of magazines, publicity has been had regularly in a large number of the motor papers, ranging from items giving the membership standing at the time to some lengthy write-ups discoursing upon the growth of the association in its several fields of activity as well as in numerical growth.

The membership growth is graphically shown giving the increase in membership month by month during the past year and showing the relative increase as compared with the three previous years. The growth in formation of sections during the past year is also graphically represented.

MEMBERSHIP STANDING OCTOBER 1, 1914.

Central Stations	102	
Manufacturers	32	
Active		134
Associate		711
Auxiliary		10
Press		30
Total		885

Eight hundred and fifty-one members are located in 35 states of the Union and a total number of 34 in the foreign countries of Canada, Australia, Denmark, England, Germany, New Zealand, Philippine Islands, and South America.

A resume of the membership, showing the division of the parts of the industry represented, is interesting in this connection and the following list tells the extent to which the lines of trade have contributed in support.

MEMBERSHIP CLASSIFICATION ACCORDING TO LINE OF BUSINESS.

Active Members.

Central Stations	102
Motor manufacturers	5
Storage battery manufacturers	8
Vehicle manufacturers	19
Total Active Members	134

Associate Members.

According to business classification of their company.

Auxiliary	43
Central Stations	134
Electric vehicle dealers and garage	12
Electrical contractors	1
Engineers	13
Garages	83
Jobbers of electrical supplies	2
Motor generator manufacturers	1
Motor manufacturers	37
Operators (owners)	23
Press	18
Storage battery manufacturers	91
Vehicle manufacturers	146
Miscellaneous	107
Total Associate Members	711

Auxiliary Members.

Charging apparatus	2
Ball bearings	1
Meters	1
Tires	6
Total Auxiliary Members	10

Press Members.

Trade paper publishers	30
Total Press Members	30

It must be evident to all that this committee has achieved the results of "Doubling the Membership" by securing the hearty co-operation of the entire association.

Use of Compressed Air in Steel Hardening

Recently there has been adopted in a foreign motor car factory a new method of hardening steel with jets of compressed air, says the *Scientific American*. The usual method of hardening steel by immersion in oil or water or alkaline baths, it is said, results in the formation of a line of considerable tension between the hardened and unhardened parts. By the use of compressed air, however, the zones of cooling may be carefully graduated and much better results obtained. By adapting the shape of the nozzle to the work, a wide range of results is possible.

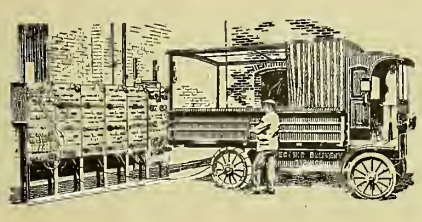
Measuring Motor Truck Economies

Mechanical Haulage Shows a Yearly Profit Determined by Individual Conditions

BY R. W. HUTCHINSON

THE first question that is asked a motor truck representative by at least nine-tenths of business firms who are thinking of installing motor trucks is, "How much money will a motor truck save me over my horse vehicles?" The almost invariable answer is that "It depends on so and so." The qualifying conditions are enough to bewilder any business man seriously seeking enlightenment on this important problem. The truth is, however, that no honest motor truck representative can truthfully say a motor truck substituted for a certain number of horse teams will effect a saving in dollars and cents which can be guaranteed in round figures. Some truck manufacturers have attempted to do business on a basis of guaranteed operating expenses for their motor trucks and guaranteed maintenance expense and guaranteed economy in accomplishing the equivalent or greater amount of work over the horse equipment, but it is safe to add that every one of these companies has gone the way of every enterprise which was not established on safe, sane and sound business principles. Although no honest motor truck manufacturer will guarantee that his product will cost such and such a figure in a day, nor that the machine transportation will effect an economy in figures which can be carried to even one point decimals, the motor truck manufacturers can prove to the satisfaction of any man that when he needs motor truck equipment and when he operates it in a manner approved by the engineering experts of their organization, the economies will be sufficient to pay a larger dividend upon the capitalization represented by the motor trucks than perhaps any corresponding investment in mechanical equipment.

A five-ton motor truck operating in public service delivery shows a gross profit of from $30 to $50 per day and a net profit of from $20 to $30 per day, figuring that the original investment for the truck was $4,500. No other mechanical equipment can show a profit of 100 per cent per year on its cost, calculating that the good motor truck is available for operation 300 business days in the year. The man who has not actually made sufficient investigation into the earning power of a motor truck is very skeptical as to the truth of a statement that mechanical haulage is showing a profit of from 100 to 200 per cent. But public service motor express companies who are operating and managing their enterprises on the same rigid business principles as are carried out in the cost accounting department, for instance, of the U. S. Steel Corporation are getting such results, and there are a number of truck companies that can prove that under as favorable conditions as these public service motor express companies are operating, it is quite possible for a business concern putting the same time and attention to its use to get a similar ratio of earning. The only reason that the operators of motor trucks are not earning relatively the same ratio of dividends on their investment is that they have mistaken the motor truck in itself as a cure-all for all of their motor truck problems and have not speeded up the inside details of the system to keep pace with the potential possibilities of a motor truck. True, the earning of 100 to 200 per cent on its investment is exceptional profit for a motor truck to show in private use, due to the fact that the public service motor companies can and do charge a larger price per ton or per ton mile for taking care of a merchant's delivery system. However, the profit which a good motor truck would show when operated in private service can and does run as high as 200 per cent on its investment cost.



The economics which motor transportation effect in delivery are seldom measurable on an exact dollars and cents basis, and in saying that the motor truck can, for the use of a private individual or business firm, show a dividend of 100 per cent, we are figuring its earnings on the basis that the first-class motor truck will enlarge the delivery area of the owner two or three times and enable him to double or treble his business clientele of customers by making quicker and more prompt deliveries and naturally double or treble profits. If the actual operating cost of a motor truck which has displaced three or four teams was taken as the measuring rule of its economy, it is sometimes the case that the expense will be larger than for the horse teams, but the earning capacity of the motor truck is so much more than that of the horse equipment through its ability to turn out twice or three times as much work, that the actual operating expense bears but an insignificant relation to its earning power. It is not the custom of the business world to place freedom from annoyance and worry incident to delays in delivery of goods on a monetary basis, and yet in truth the absence of the worry which a good motor truck insures in a business organization may have a divided feature which by itself would make a motor truck a profitable investment even if it accomplished nothing else than to save the energy of its owner for more productive work in gaining new business and holding it. And in holding new business the motor truck is the most favorable adjunct in business equipment, as it enables the carrying out of contracts which, if not fulfilled always jeopardize the future custom from the customer who has been disappointed.

Sufficient facts have now been shown by the motor truck manufacturers to prove that the economy of motor transportation justifies the cost of re-equipment of a delivery system entirely with motor trucks. Perhaps the strongest proof of the economy of motor trucks as a real tangible quantity and not a fictitious estimate of the enthusiastic motor truck representative is shown in the fact that all of the large corporations in the United States who have adopted the motor truck during the last three or four years and have had in that time ample opportunity in which to determine its economy, there is not

a single complaint. If the motor truck had not proven its way these large business organizations, many of which operate their transportation systems in the same efficient and business-like manner in which they operate their manufacturing plants, would have been heard from long before this in denunciations of the motor truck as a failure. It is a most impressive fact that hardly a single one of the large users of power wagons who have put their squadrons of motor trucks on an exact business system of operation and cost accounting have uttered a word, except in the most commendatory terms, of the revolution which the new transportation agency has effected in their business. It is certain that if the large squadrons of trucks which are owned by big corporations were not profitable the business world would have been told so in unmeasured terms by these corporations. The truth is that the owners of the large squadrons of motor trucks are saving so much money in the transportation end of their business that they are silent about giving out any figures showing the economies which their trucks have effected.

In this connection it is interesting to note that there are two classes of motor truck operators. The first class, which is greatly in the majority, keep only such insufficient records as to prove to their satisfaction that their trucks earn a substantial profit. As to the exact amount of this profit they are little concerned, and it is exceedingly difficult for the motor truck manufacturer to glean any cost records from this class of its customers, as the records are so incomplete as to give only the main facts which the owner desires to know—"The truck is earning big money." The second class of truck operators, who are exceedingly in the minority, have kept accurate records of their motor service costs, but they exercise the geatest care in preventing these records from leaving their offices; taking the stand that the longer they keep the information from their competitors the greater the period th y can enjoy the advantages which their competitors do not possess, and which enable them to make larger dividends on equivalent capitalization than their competitors. The writer, for example, once asked the traffic superintendent of one of the largest public service delivery companies in the United States for some actual records of his horse and his motor truck equipment. He was met with this rejoinder: "You can't have them. We don't propose to give away this information, as it would start our competitors buying motor trucks, the superiority of our service will be lost, and they would be on an equal footing with us. Just as long as we can keep our competitors from getting these trucks, just so long we will continue to have a certain monopoly. We are not philanthropists and have nothing to give away. If you want any cost records you will have to dig them up from somebody else." This attitude of the successful operators of motor transportation is, of course, in a way a retarding feature to the more general utilization of the motor truck, and if the large corporations would give out some facts regarding the savings these trucks are making for them the smaller concerns now operating from five to one hundred teams would have sufficient confidence in the motor truck to put more faith in the representative's statements and would begin motorizing their systems.

Perhaps no corporation in the United States is better known for the business-like principles in the conduct of every feature of its service than the New York Telephone Company. This company is picked as a model by all progressive telephone service managers throughout the United States. Its sanction of any new wrinkle in business accounting or in business administration is taken as the last word from business efficiency experts. The New York Telephone Company was one of the first large corporations to begin experiments with motor transportation. Its first motor equipment naturally was of the electric driven type and obviously as a matter of policy and efficiency as well, most of its truck equipment is today of the electric type.

New York Electrical Exposition

No electrical show in this country creates more interest or is as largely attended as the annual electrical exposition and motor show in the Grand Central Palace, New York City.

The 1914 show will open on October 7th and will continue day and night until October 17th, inclusive.

A number of the most representative manufacturers of the country have already taken space for this coming event and many startling innovations are promised.

Among the many surprises will be a new low priced delivery wagon within the financial reach of every merchant in the country. The name of the company and the new car is to be kept secret until the opening day of the show. All the electric lighting companies in and around New York will be represented by interesting exhibits of what they are doing, and what they are prepared to do for their current users.

Unusual care and attention are being exercised by the managers to make this year's show the most comprehensive as well as the most attractive of any ever held, and the decorations and musical programmes will be especially elaborate.

Rauch & Lang Float Prize Winner

The Zell Motor Car Company, Baltimore, Md., was awarded the first prize in the floral automobile parade held September 8 as a part of the Star-Spangled Banner Centennial Celebration. The prize was a set of four automobile tires.

The prize-winner was a Rauch & Lang electric brougham. The float represented a Japanese tea garden and was designed by Herbert M. Hartman, general manager of the Zell Company. The work on the entire float was executed in the shops of the Zell Company on Mount Royal avenue. The Japanese tea garden effect was carried out artistically, and it is said the judges had no trouble at all in coming to a decision as to the Zell float being the most beautiful in the parade. The bamboo trimmings, the iris and wistaria and chrysanthemums all blended together in making the tea garden beautiful.

The Anderson Electric Car Company of Detroit, Mich., has, by invitation, become a member of the Rice Leaders of the World Association, founded by Elwood E. Rice.

This association is formed of leading American manufacturing concerns, among which the Anderson Electric Car Company will represent the electric pleasure and commercial car industry. Each concern enjoys an exclusive membership in its particular line of business.

Early History of the Electric Vehicle

First Motive and Impulse to Construct Electrics as far Back as 1886

BY R. McALLISTER LLOYD

THE first impulse to bring into existence the electric vehicle came from a desire on the part of storage battery manufacturers to find a market for batteries. The battery business began in 1886 and for four or five years all efforts were spent in developing street railway traction. Manufacturers seemed to feel at that time, that the great field for storage batteries was for use in connection with street cars, but as storage battery traffic of that day was not very successful, manufacturers endeavored to find a new outlet for their product.

The early history of storage battery development concerns two big companies, the Consolidated Storage Battery Company which brought the Julius battery from Europe and purchased the Brush patents in this country and the Accumulator Storage Battery Company which brought the Faure batteries to this country in 1886. These two companies were soon involved in long and costly patent litigation. Each sued the other and each had its patents sustained. The factories of both were therefore shut up by 1891.

The Accumulator Company then retained me as engineer with a view to avoiding the infringement of other patents and to study and investigate possible applications of the storage battery. We did not know at that time what good they were, if they were not used in street cars. About the first application that suggested itself was electric vehicles. A great French engineer, Hospitalier, published a paper in 1891 conclusively proving it impossible to run a vehicle with batteries that would go up a seven per cent grade in a road. This could not be refuted for the reason that nobody had tried it and the first electric vehicle that I saw was in 1891.

In the winter of 1896, the Accumulator Company began to build twelve electric omnibuses for service in Washington, the people there being unable to obtain a franchise for laying tracks in the city streets. The first one of these put into service was so bad that the other eleven were never built. But we got a little experience.

About that time the Electric Storage Battery Company of Philadelphia came into existence bringing from Europe the chloride battery which was not supposed to infringe the patents in this country. Both of the old companies contested and shut them up. It was then becoming apparent that the only way to accomplish anything was to get together and all three companies were merged together as the Electric Storage Battery Company in 1894.

The engineers in the Consolidated Battery Company, Morris and Salom, wanted something to do. They told the Storage Battery Company that something ought to be done in the way of exploiting the electric vehicle and said they could work up this business. That was in 1893.

Meantime, while this get together movement was going on I started the Plante Company which sold out in 1895 to the Electric Storage Battery Company. In 1896 the Morris and Salom developments crystallized in the Electric Wagon Company which put into service a dozen cabs and ran them two seasons.

The first motive in the development of the electric vehicle was the desire on the part of the Storage Battery Companies to find a market for their product; the second motive was public praise. Everybody wanted to ride in, hire or buy an electric vehicle or buy stock in a company. The Electric Vehicle Company was organized and put into operation fifty cabs in New York, so popular was the stock that it was hardly possible to organize companies with enough stock to go around without hurting somebody's feelings. There were the New York Transportation Company, the New England, Illinois, Washington and other companies. About seventy million dollars were invested in the industry of which eight millions were paid in cash to the Electric Vehicle Company. The public wanted the electric vehicle.

In 1899 the Pope Company bought a plant at Hartford. They put through one order for 1600 electric cabs. They had about 4000 other electric vehicles going through the shops at Hartford. This was indeed quantity production for those days. They had not been under way long before they found the product was no good. Tires had not been developed; only single tube tires which ran about two or three hundred miles and other parts were very imperfect. The public interests in financing the industry were disappointed. Engineering had not all been done, even though we had much money. The industry collapsed in 1900, the companies were liquidated. That was the end of the second impulse, the impulse from the desire of the public for an automobile.

Then came the dark ages of the business. In 1901 I met Lucius T. Gibbs who had some good ideas in regard to electric trucks and together we backed a company called the Vehicle Equipment Company and started making trucks.

There were in this country at that time six thousand wagon builders who wanted to get a chassis and then build the body and the rest of the vehicle. So we thought we could build the running gears and the chassis and sell them to the wagon builders. We rented a place in Brooklyn and started 40 vehicles. By the time we were ready to dispose of them the wagon builders had changed their minds and we could not sell one of them.

We had to make good, so we developed larger works, went into the wagon business and tried to sell to the trade. That went on for almost six years. In 1905 the Vehicle Equipment Company put out a thousand vehicles. The company had gone through all sorts of vicissitudes, even bankruptcy, and was reorganized as the General Vehicle Company, but even as late as 1908 we were still in the dark ages. We got lots of sympathy, but no co-operation. Finally they talked about an electric vehicle man as somebody who was a little "off." Everybody had lost faith in it. Motor manufacturers, big as they were, gave it up as a bad job. The electric light companies were skeptical.

In the early part of 1908 a great many improvements were made in the construction of the vehicle.

Better tires, bearings, etc., made it possible to produce electric vehicles which really made good. Letters began to go through the mail regarding the economy and advantages of these wagons over gasoline trucks, and the business became an industry. At the end of 1908 the pioneer phase was over.

The next real impulse the business got was from the electric light companies, due to their desire to increase the field for consumption of current, and that was the last and was really the prime motive in the organization of this society. So you see the manufacturers of batteries, manufacturers of motors and public utilities have all been working together to make this a success. After the first and second impulse I do not know just how the business got along in the dark ages or what kept it going. Woods, Baker, Studebaker and others hung along, all feeling somewhat discouraged, but putting up a hard fight.

I made up my mind in 1901 that the electric vehicle was a possibility and could be made a power in the world and I determined to see it through. I assure you that there were lots of men around me and on deck today who were working for something besides the salaries they got. They felt that they were enlisted, which demanded devotion and real sacrifice. We were all pioneers together, salesmen, producers, engineers, in that business. We were proud that we had accomplished something, though not as much as we expected, coming nearer and nearer to what we aimed at. That spirit still holds good with all the men who were connected with the business.

Of course you are not interested in this ancient history and I believe you are more interested in the present and the future. I do not believe in any one man or any one idea. All men and all ideas working together can obtain better results. I believe that the little special wagon will help the big truck and that the big truck will help the little truck and that they will both help the pleasure car. I believe that all these interests working together will produce something better in the way of the electric vehicle. The electric vehicle of today is good, but we cannot stop now. We must go on making improvements, small but in a few years they will have so multiplied that the vehicle of that day will be a vast improvement over the present. Our inspiration is in the future and we must not stand still, but have some faith in the coming great improvements and achievements.

I am sure that I can predict it; I know it is coming, and if we work together, in ten years most of the 60,000 horse vehicles will be displaced by electric vehicles and we shall see a substantial number of pleasure vehicles running side by side with them."

Storms Electric Announces New Product

A new electric automobile, manufactured by the Storms Electric Company, Detroit, Mich., will make its appearance in the market the first of the year. The company plans to manufacture three models, a three-passenger coupe, a two-passenger roadster and a 500-pound light delivery car. The price of the new cars is to be low enough to bring them into direct competition with low-priced gasoline machines.

The coupe is to have a mohair top and will be upholstered with broadcloth. It will sell for $950. The roadster will be upholstered in leather with mohair top, and will sell for $750. The delivery car will sell for $650. All three machines are to be fully equipped with electric lights, both inside and out, and with electric horn. They will travel 40 to 50 miles on a single charge. They will be 44-inch tread with a 90-inch wheel base and 28x3 tire, either pneumatic or cushion. The Storms company expects to have its line on display at the Detroit auto show. They will also display in other cities, if possible.

William E. Storms, the designer of the car, formerly was associated with the Detroit Electric Company as final inspector. He has been in the automobile business ever since its inception. Officers of the company are: William E. Storms, president and general manager; Ferdinand H. Zillisch, of Milwaukee, vice-president; Fred T. King, secretary and treasurer

Walker Assumes Chicago Electric

The Walker Vehicle Company, Chicago, issues the announcement that it has taken over the Chicago Electric Car Company which recently closed up its business for the benefit of its creditors and will continue manufacturing the original product at the Walker Company's plant.

The Chicago electric was always considered as a splendid product and although to a great extent local, many vehicles have been sold to satisfied owners. An examination of the company's records showed assets of $91,000 and liabilities of $45,000. The new organization announces that the vehicles will be sold at the same price, the sales organization to remain under the management of Gail Reed, formerly secretary of the Chicago Electric Company.

Electrics at San Diego Fair

It is announced the only vehicles to be allowed on the grounds of the San Diego exposition, which opens January 1, are two ½-ton electric trucks built by the Beardsley Electric Company, Los Angeles, Cal., and the electric wheel chairs.

The Beardsley electric trucks are to be ready for service within another week, having been equipped especially for service on the exposition reservation. One is to serve as the official ambulance and the other is to be in the service of the treasurer of the exposition. These are the first two trucks built by the Beardsley company and attracted a great deal of attention at the Los Angeles motor truck show last week.

Novel Electrics for Exposition

Two hundred "electriquettes" have been ordered for the San Diego Exposition, for delivery Christmas Day, one week before the opening. This device, propelled by a low-speed electric motor, so simple of control that the 10-year-old daughter of one of the European officials operated it without previous practice, will be the only vehicle allowed in the grounds. It can not go more rapidly than three miles an hour on a down grade and can be stopped within three feet by an emergency brake, operated by either of the two passengers it will hold. This "baby electric" was devised to make unnecessary the laborious push-chair of previous world's fairs.

By way of increasing the safety of pedestrians and the occupants of other cars, the New Jersey legislature has ordained that after January 1, all commercial vehicles must carry mirrors which will afford their drivers an unobstructed view to the rear.

Delivery Operating Costs

The Osborne-Norman Company, Erie, Pa., owns a dry goods store, and handles, in addition, carpets, linoleums, and household goods generally, apart from heavy furniture, stoves and the like. The articles to be carried are, therefore, reasonably light and not bulky, and can, as a rule, be handled by one man. Erie being a compact district, the company's delivery area extends only about six miles, and the roads in the town itself are of good surface, many being paved with asphalt. The suburban road surfaces are good in dry weather, but in the rainy season the mud is a factor that has to be considered. An average of 450 packages per day is delivered, or 225 each for the two 1½-ton General Vehicle electrics employed. The cars, which are designed for weights up to ½ ton, will run about thirty miles on a single battery charge, and this has proved adequate for a day's working, except when a long round has to be covered. On these occasions a boosting charge is given at noon, and enables the longer distance to be covered without risk of battery exhaustion.

The cars are housed close to the firm's premises in a public garage, where their batteries are charged, the vehicles cleaned, and any adjustments made. This work is carried out for a fixed payment per vehicle of $22 per month. Solid tires, costing $140 the set are fitted on the cars, and are good for about 7,000 miles, equal to a year's running. The batteries, which are of the lead variety, are guaranteed for four years, and cost $300, the yearly battery allowance being, therefore, about $75.00. Depreciation is allowed for at 15 per cent, but the users state that this is excessive, as they regard electric cars in good condition as having a distinct advertising value, while allowance is already made for battery depreciation, the principal item in electric vehicle maintenance. With good management, Mr. Osborne is of opinion that $5 per month, is sufficient to cover depreciation other than that of the battery. In the table appended, however, the 15 per cent basis is allowed for. The monthly costs per vehicle work out as follows:—

	Per month.
Rent, current and adjustments	= $22.00
Wages	= 45.00
Interest on cost ($3,660)	= 9.15
Tires	= 11.60
Depreciation (15 per cent)	= 28.87
Battery depreciation	= 6.25
Replacements	= 5.00
	$121.87

These figures apply, of course, only to the cost of external delivery service, and the cost of delivering each package works out at the extremely low average of $.0216. The garage and battery charging costs are low, but even if they were doubled the cost of delivery would not be increased by ½c per package. Wages for the drivers are also low for America, being at the rate of just over $10 per week, but the drivers are young men between 18 and 21 years of age, and are not skilled mechanics. The chief cause of the low operating costs lies in the fact that the vehicles are always worked under conditions for which electric system proves ideal, *i. e.*, for short runs out and home from a centrally placed depot, over good road surfaces.

A little hard grease on the thumb nuts that make the battery connections will prevent their seizing from acid corrosion.

Discourage Use of Truck Trailers

Inquiries addressed to members of the National Automobile Chamber of Commerce regarding the desirability and economy of using trailers with standard motor trucks have been answered in detail by the following twelve companies:—

Avery, Baker, Federal, General Motors, Kissel, Locomobile, Packard, Pierce-Arrow, Speedwell, Velie, Waverley and White.

The preponderance of opinion is decidedly against the practice except in very favorable conditions, such as on level, smooth hard roads, with slow speed and proper handling. Given such conditions the standard truck may be used successfully for hauling trailers, but in no circumstances should a trailer be used without the consent of the manufacturer, as the guarantee does not contemplate such use. In any other condition the practice is of very doubtful economy; therefore truck manufacturers do not encourage the use of trailers unless they examine the field of operation and know that their trucks can handle the work with trainers.

The standard truck is designed for a definite load and speed and as a rule is not rugged enough for this service, which is most likely to be done outside of cities, where roads are poor and grades steep.

For use as a tractor, the truck should have a powerful engine, strong construction throughout, especially liberal bearing surfaces and a clutch that will engage and start the load without a jerk. The horse power developed and the gear ratio should be proportionate to the weight of the vehicle and trailer with loads.

Successful employment of trailers, except under unusually favorable conditions, calls for the special construction of tractor trucks and of trailers designed for use with them. Such a tractor should have at least five or six possible speed changes, if gasolene economy is to be maintained. An electric tractor requires increased battery capacity.

Electric Motor Club Holds Annual Dinner

The annual dinner and meeting of the Electric Motor Club, held at the Thorndike Hotel, Boston, Mass., was probably one of the most successful that has been held since the club was organized several years ago. The talk by William W. Swan of the Associated Press on "Gathering News" was a departure from the talks usually given at these affairs and was perhaps as interesting as any that has been heard by the club.

After an informal reception, dinner was served in the large dining hall on the second floor, with about 40 members present. After this the several committees reported, that on Salon reporting that the annual electric show will be held at the Copley-Plaza Hotel November 2 to 6 inclusive. It was announced that more than 14 different makes of cars had already been allotted space and that several would be added in the next week or 10 days, which will make the event no doubt as large as that held last year. The committee on parking spaces for automobiles along Tremont street was made, and with it plans were shown giving an entirely new phase to this matter, which has been of such great interest to automobile owners of Boston. The matter was gone into to some extent and a committee was appointed to continue the good work already started.

PERSONAL AND BUSINESS NOTES.

William F. Bauer has been appointed manager of the Chicago office, Edison Storage Battery Company succeeding C. B. Frayer who retired November 30 to devote himself to private interests. Mr. Bauer is a pioneer in the storage battery field and has been a familiar figure in railway and electrical circles of Chicago since he went there in 1906 as sales engineer of the Electric Storage Battery Company. Mr. Bauer has been with the Edison Storage Battery Company about a year as assistant manager of the railway department. He is president of the Railway Electrical Supply Manufacturers' Association, an organization in which he has been active since its formation.

Francis V. McGinness, sales engineer of the Edison Storage Battery Company, Orange, N. J., has been appointed assistant manager of the railway department, taking the position of William F. Bauer, who was recently made manager of the company's Chicago office.

H. B. Raney, formerly of the Walker Vehicle Company, Chicago, has accepted a position as manager of the Chicago branch, Ever Ready Battery Company, 1238 Michigan avenue.

Milburn Wagon Company has opened a Chicago branch office in the row, the agency controlled by the Schillo Motor Sales Company. Mr. Bachelor has been put in charge.

L. E. Wagner, formerly with the Baker Electric Sales Company, has joined the retail sales force of the Anderson Electric Car Company.

G. K. Cole, formerly with the General Motors Truck Company, has accepted a position as salesman with the Anderson Electric Car Company at Chicago.

H. P. Simpkinson, formerly of the Commonwealth Edison Company, has opened the Adams Electric Garage, 918 East Forty-third street, Chicago.

E. P. Chalfant, formerly general manager of the Association of Licensed Automobile Manufacturers, has become secretary of the Electric Vehicle Manufacturers' Association, comprising a group of electric pleasure car makers, and has established association headquarters at Chicago.

The Beardsley Electric Company, Los Angeles, Cal., will manufacture, in addition to its line of passenger cars, 1,000-pound and one-ton commercial chassis.

Theodore C. Reid has been appointed sales manager for the Anderson Electric Car Company, Detroit, Mich., in Detroit and in Wayne county.

W. Robinson, former automobile editor of *La Presse*, a Montreal newspaper, has become identified with the Wagenhals Motor Car Company, Detroit, Mich.

C. W. Nash, president of the General Motors Company, Detroit, Mich., has appointed D. K. Moore sales manager of the Northway Motor Manufacturing Company, Detroit, Mich., and of the Jackson-Church-Wilcox Company, Saginaw, Mich. He was formerly sales manager of the Weston-Mott Company, Flint, Mich.

Hess-Bright Manufacturing Company, Philadelphia, Pa., has just completed the foundations of an additional structure at its plant in that city which is to be as large as the present building. Approximately $320,000 is to be spent in new machinery. This is exclusive of the cost of the new structure. When the new addition is completed, the capacity of the Hess-Bright company will be doubled.

E. J. Bartlett, sales manager of the truck department of Baker Motor Vehicle Company, Cleveland, Ohio, who has been in England for three months negotiating with English representatives for the Baker company, has recently returned to the plant in Cleveland.

N. F. Sutton, Pontiac, Mich., for almost a year a member of the sales force of the General Motors Truck Company, has been appointed manager of the company's branch at St. Louis.

E. L. Campion, for thirteen years a member of the sales organization of the Firestone Tire & Rubber Company, Akron, Ohio, has resigned as manager of the Seattle, Wash., branch of that company to accept the position of sales manager for the Marathon Tire & Rubber Company, Cuyahoga Falls, Ohio.

The General Motors Truck Company, Pontiac, Mich., has moved the salesroom of the Boston, Mass., branch from Boylston street to the service station at 944 Massachusetts avenue.

The Hyatt Roller Bearing Company, Detroit, Mich., is erecting another factory in that city, which is to be 75x200 feet in size, six stories high, with basement. It is constructed of steel and concrete, and conforms in design with the group of other buildings already erected. Machinery is being installed in the lower floors while the top floor is being put on.

The Ahlberg Bearing Company, Chicago, Ill., has opened an office and factory in Los Angeles, Cal. This company makes a specialty of regrinding annular ball bearings.

G. T. Milne, British trade commissioner for Australia, says that the municipal council of Kalgoorlie is anxious to secure bids for a five-ton electric truck. This is required for the transport of road metal, for street watering purposes and for drawing sanitary carts. The maximum speed is to be six miles per hour.

The Willard Storage Battery Company, Cleveland, Ohio., is erecting a new plant which will provide six acres of floor space for the production of the widely used LBA batteries. The new plant will include ten buildings and will be equipped on such a scale as to amply provide for the company's needs for an indefinite period.

Car Census at Two Million

According to the latest census figures covering automobile registration in the various states, there are now 1,735,369 automobiles in use in the United States. There has been a steady gain since the first of the year. These figures are both for gasoline and electric pleasure and freight vehicles. On January 1, 1914, there were 1,253,875 cars in use. By the latest census, New York is far in the lead with 160,475 cars registered. Illinois is next with 126,681 and there are only four other states in which the figure runs 100,000 or over. These are Pennsylvania, Ohio, California and Iowa, in that order. The State of Nevada has the fewest cars, the registration showing but 1,523 in use.

Electric Truck Reduces Time

In the report of the electrical bureau of the City of Philadelphia, just issued, the following appears:

"The time required in repairing troubles on the underground system has been very much reduced by the use of an electric truck, the number of hours in which the underground circuits were out of service having been cut down about forty per cent in 1913, as compared with 1912. The cost of operation in 1913 was a little less than for 1912, even with the greater amount of work. The forces employed were twenty, as compared with twenty-one in 1912."

Baker Electrics for England

The Baker Motor Vehicle Company, Cleveland, O., has recently closed negotiations with the Wolseley Motors, Ltd., Proprietors, Vickers Ltd., London, Eng., to represent it in England. The new agents expect to operate particularly with trucks as the conditions in England at this time are said to be especially favorable for this type of vehicle. They now have in operation a number of Baker trucks as demonstrators and will begin at once to handle their sale.

Electrics for Funerals

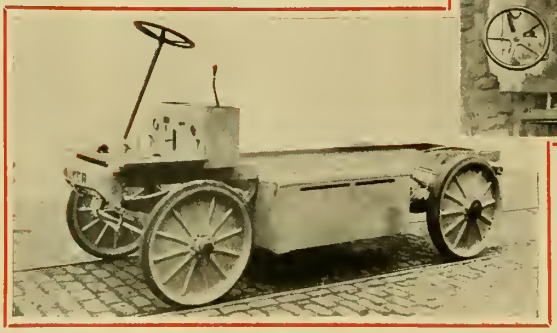
Twenty-five thousand dollars' worth of Rauch & Lang electric limousines have been delivered by the Zell Motorcar Company, Rauch & Lang distributors, to William Cook, Baltimore, Md., undertaker.

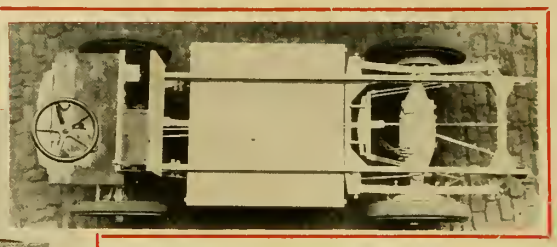
The Rauch & Lang Carriage Company of Cleveland, Ohio, makers of the Rauch & Lang, advise that this order is the largest of electrics ever placed in this country for motor funeral purposes.

General Vehicle Publication

G. V. Bulletin is the title of a splendid house organ which is being published monthly by the General Vehicle Co., Long Island City. The bulletin offers many interesting developments of electric truck service. Illustrations are numerous each showing some phase of a particular industry in which G. V.'s are solving the delivery and haulage problem.

New Models of
WALKER ELECTRIC VEHICLES





This style chassis can be furnished in any capacity from 1,000 lbs. to 8,000 lbs.

WALKER VEHICLES should be investigated by every user of Commercial Vehicles. At least 75% of all city and suburban hauling and delivering can be done more economically and satisfactorily by Walker Electrics than by horse or gasoline vehicles, especially when stops are frequent.

Walker Electrics have a greater mileage capacity per day than the driver and the helper on all city work.

Let us know your service conditions and we will tell you frankly whether it will pay you to use Electrics.

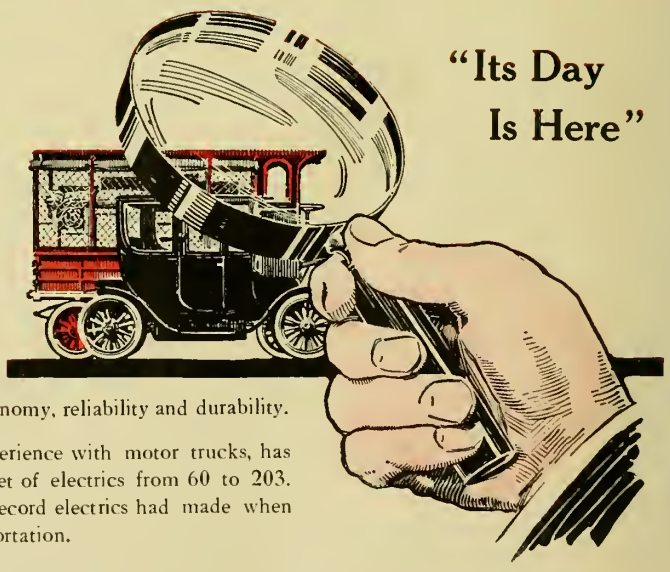
WALKER VEHICLE COMPANY

CHICAGO

More Walker Electric Vehicles have been sold in Chicago than any other make of either Gasoline or Electric Vehicle.

398

INVESTIGATE THE ELECTRIC



"Its Day Is Here"

TWO-THIRDS of the gasoline trucks in service today will be replaced by electrics; this is the statement of a transportation expert.

The man who half investigates and buys gasoline trucks will be forced by economy or competition to change to electrics. This is expensive and unnecessary, especially in view of the record made by electrics as to economy, reliability and durability.

One large Chicago firm of fourteen years experience with motor trucks, has in the last eighteen months increased their fleet of electrics from 60 to 203. This addition was made *only* because of the record electrics had made when compared with their other methods of transportation.

Whether you own one horse and wagon or a fleet of gasoline trucks — you should investigate the electric.

Our Vehicle Engineers are at the service of Chicago firms.

Commonwealth Edison Company

120 West Adams Street : : : Chicago

398A